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The American

GAS LIGHT JOURNAL.

(ILLUSTRATED.)

DEVOTED TO THE INTERESTS OF

ILLUMINATION, HEATING, MECHANICAL, CHEMICAL

AND

GENERAL SCIENCE

VOLUME LXXXVI.

(FIFTIETH YEAR.)

FROM JANUARY 1 TO JUNE 30, 1907.

A. M. CALLENDER & CO., Publishers.

OFFICE OF PUBLICATION, NO. 42 PINE STREET, NEW YORK CITY.

THE AMERICAN GAS LIGHT JOURNAL

REDMAN & KENNY, N.Y.

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VOLUME LXXXVI., No. 1. Whole No. 1,648. | NEW YORK, MONDAY, JANUARY 7, 1907. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager. THOMAS J. CUNNINGHAM and ELBERT P. CALLENDER, Editors.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

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BRIEFLY TOLD.

"THE NATURAL GAS JOURNAL."—The initial issue of *The Natural Gas Journal* is before us. It is dated the current month, and its headquarters show that it is a near neighbor, in that they are in 56 Pine street, "this city." It is to be published once a month, and its field is the natural gas one, which heretofore has not had a distinct representation in the publication arena. Its Managing Editor is Mr. J. Alex. Mayers, who needs no introduction to the fraternity at our instance. That he is capable of directing successfully this new enterprise goes without questioning, for the JOURNAL has had much of practical favor at his hands and pen, and that he wil make an unqualified success of it is not only our hope but our belief. The first issue is brimful of interest, and we repeat our expression that success in unstinted measure will be its portion.

CURRENT COMMENT.—

WE are indebted to Mr. Thomas D. Miller, of the New Orleans (La.) Company, for the following heartfelt mention respecting the late Mr. Jules Edward Schneider: Jules Edward Schneider was born in Strasbourg, Alsace, May 18th, 1843. His father moved to America in 1846, settling in New Orleans, where the subject of this sketch spent his youth. In 1871, Mr. Schneider moved to Dallas, Tex., to engage in business, where he resided until December 7th, 1906, when he passed quietly away after a protracted illness which had kept him for 2 years from active participation in his extensive business operations. The Dallas gas works were built in 1873, and the organization of the Company was effected with him as President, which office he held continuously to the time of his death. During his 33 years in the gas business he took a deep interest in all the wonderful developments in that time and always stood ready to adopt improvements that were tried and proven. He brought home from Vienna, in 1886, some Welsbach burners, and the Dallas plant was probably the first one in the West to put the Welsbach burner on the market for consumers. He was a staunch friend of young men who showed the proper spirit, and a lover of truth and justice. One of the (now) old employees of his commercial business said the other day: I was associated with Mr. Schneider for 25 years. In all that time I never saw him display ill temper or heard him speak a harsh or unkind word to an employee, and every man connected with the establishment loved him. To this sentiment I desire to most sincerely subscribe, having been intimately associated with him in connection with his gas interests for 11 years.

OBITUARY.—MR. ADAM WEBER.

Last week we were obliged to chronicle the death of Mr. Adam Weber, who passed away at his home in this city, at the age of 82. As promised then we now give a short history of his life, which was that of a man of resourcefulness, hard work and success. For the main facts of this recital we are indebted to the attention of his son, Mr. Albert J. Weber.

Mr. Adam Weber, who was one of the pioneer Germans in the city of New York, was born, in 1825, in Bechtheim, near Worms-on-the-Rhine, in the Grand Duchy of Hessen Darmstadt. His father was an architect and builder, to whom he was apprenticed. In 1827 he left home for New York, sailing from Liverpool in the full-rigged ship "Columbus," then making her maiden voyage. In due time a landing was made at the old Battery wharf, and the voyager's purse was slim indeed. Spurred to activity by need, he speedily found employment with a local architect and builder, and here he prospered well. His firm, unable to retain him from a salary point of view, accepted his resignation, and he then set out on his individual account as a builder. He was successful almost from the outset, and as monuments to his achievements in this line may be noted all of the huge sugar refinery houses that were erected and operated by the Havemeyer family and its co-ordinate branches in New York, Brooklyn and Jersey City. In 1855 he established the first large firebrick factory erected in the United States, the firm name being that of Kreischer & Weber. In 1857 that partnership was dissolved, and the succeeding firm of Maurer & Weber constructed the then largest firebrick factory in the country, the plant being located on East 15th and 16th streets, between Avenues B and C. It covered an entire block, and the plant included one of the largest chimneys built in New York city. It stands erect to-day, and is familiarly known as the Weber landmark, a mark of guidance to many hundreds of navigators of the East River, who took their reckonings from it to steer clear of the dangerous rocks that marked the shore lines of its turbulent tides.

In 1858 Mr. Weber, through his intimate knowledge of fireclays and their refractoriness, conceived the plan of putting on the market a clay retort to supersede the iron type of retorts then almost universally used in gas works. His plan and theory proved successful from the very start, in spite of the objections urged against his promulgations. In fact, so general did the use of the clay retort become that in a very few

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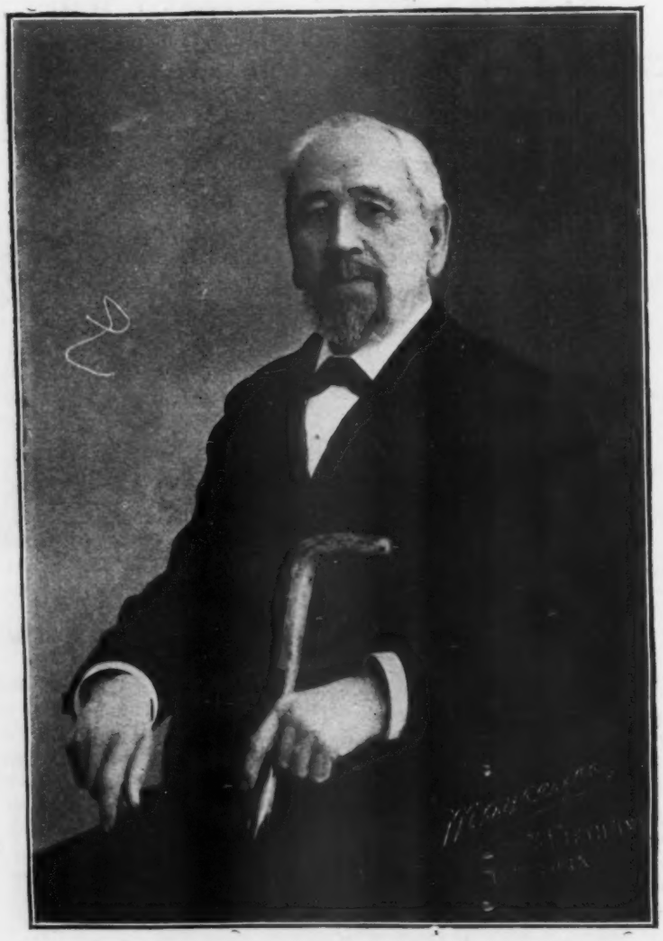
years the returns from its sale caused the penniless immigrant boy to become a wealthy man. His plans of construction were stamped with the seal of European approval, and the Weber model found speedy adoption in the gas works abroad. He patented many forms of design in bench work and furnace construction, among which may be mentioned the Weber half-depth and full-depth recuperative systems. He personally installed the bench work in the generating houses of the New York Gas Company, the Manhattan Gas Company, the Metropolitan Gas Light Company, the Mutual Gas Light Company, the Municipal Gas Company, the Knickerbocker Gas Company; in fact, his name was a household word in this section of the country wherever gas works construction was either completed or underway. To enumerate the many installations made by him would be like calling the roster of almost every city in America. Further, his work also was known abroad, as installations all over the Island of Cuba, South America and in old Mexico City well bear witness. His goods also found erecting hands in China and Japan. Mr. Weber was further noted as the inventor of an advanced lime process for the elimination of carbonic acid from gas. He was the contemporary, associate and friend of such engineers and gas men as General Roome, the Smiths, the Sabbatons, Joseph R. Thomas, G. Warren Dresser, the Greenoughs, father and son, W. H. Pearson, Jas. Somerville, Geo. A. McIlhenny, George Dwight, the Slaters, father and son, Theobald Forstall, the Cartwrights, Col. Benson, Capt. White, of beloved memory, the Youngs. But a stop in the naming must be made, for the list would virtually include all those who were actively at work in the profession for the half century between 1850 and 1900. In 1890 he partly put away active business cares, for in that year the corporation of Adam Weber's Sons was formed, and unto them came the task of carrying on the business in the great factories constructed by him in the town of Weber, Middlesex county, N. J., which works were models, and the hamlets (also of its ownership) of which sheltered hundreds of his workmen. On his retirement from active business the corporation went into the custody of his two sons, the late Oscar B. Weber (bluff Oscar, who died so suddenly, September two years ago), becoming its President, and Albert J. Weber, its Vice-President. Deceased was a prominent member of the American Gas Light Association and of the Pacific Coast Gas Association. Naturally, his wealth and activity caused him to be interested in very many enterprises, as this bare list will show. He was on the rolls of the American Engineers' Club; the Lotus and Manhattan Clubs; of the Deutscher Liederkranz and the Arion Clubs; a founder of the German Society, of New York; of the Germania Bank, the German Exchange Bank, the Union Square Bank, the Corn Exchange Bank, and the Trust Company of America; of the New York Independent Ice Company, and one of the largest shareholders in the Consolidated Gas Company. In fact, his shareholdings in gas securities were large and many. He was a noted Mason, his connection with Trinity Lodge, No. 12, F. and A. M., of which he was Past Grand Master for many years, having covered at least half a century. His connection with other civic and charitable societies was also notable.

As a pubfic man perhaps his connection with the Board of Education in New York City was most prolonged and zealous. It was through his persistence that the teaching of German in the public schools was brought about, and for his success in this direction that the Grand-



father of the reigning German monarch caused to be transmitted to him through the German Embassy at Washington, a resolution of thanks. The Emperor also vested in him a decoration of high order. The Weber home was the meeting ground for the songsters of all nations, and within its hospitable walls frequently rang the voices of those that elsewhere for pay swayed the thoughts and emotions of tens of thousands. He is survived by his widow, Catherine Elizabeth, his daughters, Lena A. and Matilda E., and two sons, Albert J. and Chas. Weber. The article of last week detailed the funeral ceremonies with sufficient clearness. But this brief note would not be finished to the mind of the writer, did he not declare that out of his own knowledge of deceased, which knowledge was gained through an acquaintanceship of 35 years, that Adam Weber was a man of men. Gruff he may have been; grand he certainly was. In him dwelt strength and resourcefulness, beautifully tempered by that charity which assists without inflicting regret, and to his home and its treasures he was a guardian animated solely by the spirit that moves those whose loving care is the great light of their lives.

[As Furnished by the Official Stenographer.—Continued from Vol. LXXXV., page 1160.]

PROCEEDINGS, FIRST ANNUAL MEETING, THE AMERICAN GAS INSTITUTE.

Held in the Auditorium Hotel, Chicago, Ills., October 17, 18 and 19, 1906.

Second Day—Afternoon Session.

The convention was called to order at 2 P.M. by President B. W. Perkins who asked the Institute to listen to a

Communication from Mr. L. L. Kellogg.

Mr. Kellogg—Mr. President and Gentlemen: The Iowa District Gas Association at a meeting held yesterday appointed a committee, and authorized them to frame an application to become affiliated with the American Gas Institute, in accordance with Section 49. Of course, we do not expect this meeting of the Institute to take formal action, but we would like to put in the application, or to set it in motion, so that we may know as early as possible what will be required of us. The Iowa District Gas Association covers the States of Iowa, Nebraska and South Dakota. Our Constitution is similar to that of the American Gas Light Association. We have not solicited membership outside of that territory, we practically have not solicited any membership except among those engaged in the business. We would like to have this put in motion so that we may organize the work along lines which will be in harmony with the American Gas Institute. The application is as follows:

American Gas Institute, Gentlemen: The Iowa District Gas Association desires to become affiliated with the American Gas Institute as provided in Article No. 49 of the Constitution, and formal application is hereby made.—Iowa District Gas Association.

L. L Kellogg,
James Haines,
George McLean,
E. G. Pratt,
} Committee.

The President—Gentlemen, I think that should properly go directly to the Governing Board. If that is the sense of the meeting, we will refer it to the Board, where it will be taken note of. Your formal application, Mr. Kellogg, I think should be filed. I think with the consent of the meeting, we will consider it referred directly according to our by-laws.

Results of Tests on "A" Meters.

Mr. W. Forstall—If this is the proper time I have some results of tests of "A" meters that I would like to present so as to get it into the record. I will not read the paper. It simply gives the results of tests made, and I call attention to them and ask for permission that they be printed in the Proceedings.

The President—By the consent of the meeting we will have these incorporated in the minutes, provided there is no objection.

Des Moines, Ia.—Results of Tests of "A" Meters, January, 1906, to September, 1906.

Number of "A" meters in service	283
Number of "A" meters removed and tested	67

		Percentage.
Cease to record	(1)	0
Will not pass gas	(1)	0
Error 1 per cent. fast, or 1½ per cent. slow, or under		61
Error between 4 per cent. and 1 per cent. fast or 1½ per cent. slow		12
Error over 4 per cent		24
Average error of all meters		2.37
" " of fast meters		2.16
" " of slow meters		21
Net error, fast		2.00

Meters in Service. Size.	No.	Meters tested. Size.	No.
5 A	283	5 A	67

Philadelphia Gas Works.—Results of Tests of "A" Meters, Oct., 1905, to Sept., 1906.

Number of "A" meters in service	878
Number of "A" meters removed and tested	114

	Percentage
Cease to record	2
Will not pass gas	3
Error 1 per cent. fast, or 1½ per cent. slow, or under	66
Error between 4 per cent. and 1 per cent. fast, or 1½ per cent. slow	17
Error over 4 per cent	12
Average error of all meters	1.9
" " of fast meters	2.4
" " of slow meters	2.3
Net error, slow	1.2

Size of A Meters in Service.		Size.	Tested.
5 A	604	5 A	76
10 A	80	10 A	12
20 A	5	20 A	2
30 A	159	30 A	20
60 A	21	60 A	3
150 A	9	150 A	1

Kansas City, Mo.—Result of Tests of "A" Meters, 1905 to September, 1906.

Number of "A" meters in service	6,235
Number of "A" meters removed and tested	518

			Percentage,
Cease to record	8	$\frac{128}{1000}$	1.28
Will not pass gas	12	$\frac{192}{1000}$	1.92
Error 1 per cent. fast or 1½ per cent. slow or under		235	45.4
Error betweeen 4 per cent. and 1 per cent. or 1½ per cent. slow		190	35.7
Error over 4 per cent		73	14.0
Average error of all meters			2.31
Average error of fast meters			1.84
Average error of slow meters			2.44
Net error, slow			1.29

Meters in Service. Size.	No.	Meters Tested. Size.	No.
5 A	6,139	5 A	516
10 A	85	10 A	2
20 A		20 A	
30 A	11	30 A	
60 A		60 A	
150 A		150 A	

The President—I think we can hear from you now, Mr. Williams. Are you ready with your report on

Novelty Advertising and New Business Methods?

Mr. G. Williams—Mr. President and Gentlemen: The programme calls for a description of the New Business Methods Department conducted by the Ohio Gas Light Association. As a great many of you are familiar with the work of that department in the Ohio Association, which was for several years in charge of and developed by our President, you remember how it has grown from year to year. Five or 6 years ago Mr. Perkins had considerable labor to induce 30 or 40 contributions, but the contributions have increased and developed from that to several hundred. Last year it was decided by some of those interested in the Ohio Gas Light Association to collect these contributions on new business methods from various managers all over the country, and publish them in book form so that they would be accessible to commercial men, solicitors, representatives of gas companies, and others who are interested in the gas business other than in a technical way. It was decided to publish these contributions again, and within 90 days it has been possible to get together this excellent collection of contributions which represents the experience of about 300 gas companies, who are interested in the promotion of gas sales. The title of Editor of this department is somewhat of a myth. The editorials, you will note, were written by men who are well-known to you, and many of them by gentlemen who are present. After the examples of newspaper advertising and magazine advertising, or booklets and circulars, etc., which are reproduced with the idea of assisting many who desire to get up such literature, examples of circular letters are given. Another feature of the work is the illustration of several modern up to-date salesrooms, something that we consider very necessary nowadays. The last section of the book is that undignified portion which was under discussion yesterday morning, to wit, the advertising portion, and which you will find very interesting. I want to take this occsaion, Mr. President, to heartily thank the contributors to this book, many of whom are present, for their kindly support in getting out this volume.

The President—Gentlemen, you have heard the report submitted by Mr. Williams. Are there any comments or questions to ask in relation to this? If so, we would be glad to hear them. I think Mr. Williams deserves great credit for the work that he has done in this direction, and for the very efficient way in which he has compiled this book. It has been put in a form so that it will be very easy to refer to hereafter. It is a text book practically on advertising, and he certainly deserves a vote of thanks from the Institute for the work which he has done. I would be pleased to entertain such a motion.

Mr. Horton—Mr. President, I move that a hearty vote of thanks be extended to Mr. Williams for the preparation of this report. [Seconded.]

The President—Gentlemen, it is moved and seconded that Mr. Williams be accorded a vote of thanks for his very efficient work on new business methods.

Mr. Shelton—I suppose in connection with that the question comes up as to the continuance of the work of the New Business Department.

The President—I think it understood that that is to be continued.

Mr. Shelton—I think it ought to be left in a little more definite way than merely understood. I think the sense of this meeting ought to be expressed in such a way that it will amount to something. I am heartily in sympathy with the work of this Department. It is a work of great practical use and something that will be constantly referred to, and I would suggest that the matter of its continuance be referred to the Directors with power to act, in much the same way that the question of the continuance of the Question Box was left to them. I think it ought to be specifically put in the hands of the Board of Directors, with power to control it and yet push it.

The President—I will ask the original mover of the vote of thanks to incorporate that in his motion with the consent of the second.

Mr. Horton—I shall be very glad to do so, Mr. President.

The President—It is moved and seconded that Mr. Williams receive a hearty vote of thanks, and that the matter be referred to the Board of Control with power to act, with a recommendation for a continuance of the work. All in favor of the motion as stated will say "Aye." Contrary minds, "No." The motion is carried. Mr. Williams, you have the thanks of the Institute for your very efficient work.

The President here introduced Mr. W. M. Welsh, M.E., of Inependence, Kas., who read the following paper on

EXTINGUISHING THE FLAME OF A SIX HUNDRED POUND PRESSURE, MILLION FEET HOURLY CAPACITY NATURAL GAS WELL.

The Vanderpool Well No. 1, of the New York Oil and Gas Company, was drilled into the gas bearing sand on the 19th of February last, at a depth of 1,430 feet. The Bartlesville sand had been passed through at a depth of 1,260 feet and had been dry. The well had been drilled for oil and when none was found in the Bartlesville sand the drilling had been continued, in the hope of striking either gas or oil at a lower level. It was expected to strike the Mississippi lime sand at 1,500 feet. As the well was, in a measure, a "wild cat" one, there had been no thought of getting such a large volume of gas at the depth at which it was found. It had been decided to case the whole with 6¼ casing and continue with a 6-inch hole for the balance. The last screw was being run before pulling out for this purpose when the gas sand was reached. There was in the hole at the time operations were abruptly terminated about 360 feet of 8¼ casing and 1 or 2 joints of 10-inch. At the top of the 8¼ was the customary drilling nipple or pipe with its top belled out to prevent the drilling cable cutting on the rough edges.

Casing with 6¼ had been decided upon as a contingency against the walls of the hole caving and filling it up or burying the tools. Before the remaining 2 or 3 feet necessary to run out the screw had been drilled the gas was found. The drilling was immediately stopped, the tools taken from the hole, and preparations made for closing in the well. On account of the gas being unexpected the necessary fittings were not on hand. Instead of using the 6¼ casing it was now decided to tube the well with 6-inch pipe and set a packer.

What material is put in a well depends upon the local conditions as to water and nature of dirt drilled through. In this case if the 6¼ casing had been set there probably would have been no further difficulty with the well, as it could have been easily tubed with 3 or 4-inch tubing. Tubing with the 6-inch was a more difficult matter, and several packers were destroyed in making the effort to set them.

Finally, on the afternoon of February 23d, when the successful closing in of the well seemed to be assured, with 1,100 feet of 6-inch tubing already in the well, and only a couple of hours work ahead, a very severe electrical storm came up, almost the first of the season.

The flashes of lightning kept playing closer and closer, until finally Mr. J. M. Landon, field manager in charge, who was at the well at the time, ordered the men to leave the derrick and seek a safe place. As was soon demonstrated, with momentary danger of fire and gas coming from the well at the rate of more than a million cubic feet per hour, the spot was not a safe one.

Within 5 minutes of the time, the 2 men who were working 40 feet up the derrick came down, and all left. Almost before they had got under the shelter of some nearby trees, and while all eyes were turned in the direction of the top of the derrick and the clouds above, there was a flash and a clap, and they saw descending a great column of fire, wide at the top and narrowing at the bottom like a funnel. Instantly the derrick was on fire and burned to the ground. Two joints, or 40 feet of 6-inch pipe, had been left rising out of the hole, and from the top of this there flashed forth a burning jet of gas 150 feet into the air. Such was the force of the flow that the flame was held off from the mouth of the casing at least 15 feet.

My first impression of the well on the second evening following the day of its taking fire is hardly describable. A number of us who had gone there, some as disinterested spectators and others with a view to considering the problem of extinguishing the fire, walked to within probably 75 feet on the windward side. I approached the well cautiously, having a decided feeling that there was considerable danger in getting so close; yet upon consideration I knew that there could be very little danger in going as near as the heat would allow. There was no danger of an explosion, as already all the gas was being burned; there was no danger of the flames catching us, as the force of the pressure in the well was sending them skyward with intense fierceness. Yet the great roar, the tremendous flame shooting forth with a power never before contemplated, filled one with awe and fear. This, however, wore off after one or two visits.

At night the scene was very beautiful, as if some wondrous torch 150 feet high, were blazing forth, The trees and bushes near the well cast vividly sharp shadows, and in fact for several miles distant distinct shadows were visible. The reflection of the flames on the clouds, on a dark night, could be seen for 50 miles or more; and with a favorable wind the roar could be heard for at least 10 miles.

This was the task confronting us: The fire must be put out and as soon as possible; yet so great a fire had never been mastered before. The problem was a new one and a big one, yet it must be solved. It was not only a problem of extinguishing the fire, but, at the same time, of protecting the well; for after the fire was out the gas must be confined or controlled, since if this were not accomplished there could be no object in extinguishing the fire. Therefore, not to damage the material in the well was a primary consideration throughout the work.

The work of our Company is done by departments. The Field Department to which this well belonged was in charge of Mr. J. M. Landon, with Mr. Thomas Gavin as Superintendent.

Ordinarily each department works out its own salvation; but this was no ordinary matter, and a general conference resulted. As engineer of the Company and head of another department, I took part in the undertaking from the first, and, as soon as he was able to do so, Mr. J. C. McDowell, our General Manager, who has probably had more experience than any other man in the gas or oil business in extinguishing large fires, joined us in the working out of the problem. In this connection I would like to say that to Mr. McDowell, more than to any other man, should go the credit of the final mastery. From the time he reached Caney, but a few days after the well was fired, until the last little puff and flicker of flames, when he saw the successful culmination of 5 weeks of the most trying physical and mental experience, he was with us. His persistency, energy, patience and encouragement all were potent factors in snuffing out, even as a candle is snuffed out (and apparently as easily when it was finally done), undoubtedly the largest volume of flame that was ever extinguished.

Upon my shoulders fell the duty of providing the apparatus. On the day following the starting of the fire Mr. Landon and myself designed a hood. We then had a very poor realization of the task before us. This hood was duly made and sent out to the well. It arrived on the ground, I believe, about daylight and we were on hand shortly after. This hood was made of about ¼-inch sheet iron riveted, and was much the shape of a cow bell with a 6-inch opening in the flat top and an 8-inch opening on the side. We looked at the well, then at the hood, and agreed without further consideration that hood number one would not do.

A method of putting out gas well fires, by which the flame is smothered by means of jets of steam, has been successful in many instances. Therefore, 9 boilers, such as are used in the oil and gas fields for drilling wells, were gathered in and set at points surrounding and near the well. Two-inch steam lines were run up to the mouth of the well. Steam was raised to a pressure of about 120 pounds and at a signal 18 jets of live steam were turned loose. One might as well have hoped to dam Niagara as to put out that fire with steam. No impression whatever was made, and, after one attempt, steam was abandoned. It was early decided that the 2 joints of 6-inch pipe which projected above the surface would have to be removed. This was accomplished much more easily than was anticipated, as it was only necessary to throw a line round the top and bend the joints through an angle of 45°. By means of this same line it was then a simple matter to unscrew the pipe from the collar close to the surface of the ground.

One of the features of the fire which caused us untold trouble, inconvenience and physical discomfort, was that the flame was divided.

The bulk of it was caused by the gas coming through the 6-inch pipe and going straight up; the balance of the flame was from the gas which came up on the outside of the 6-inch and inside the 8¼. This gas, striking the elevators which were supported on the top of the 8¼ and were clasped around the 6-inch, supporting the 1,100 feet of it which had been lowered into the hole when work was stopped on the afternoon of the thunder storm, spread in 4 separate secondary flames which shot out in a horizontal direction for distances varying from 10 to 20 feet. These flames did more to prevent our near approach to the well than the very much larger body of flame which went directly upwards.

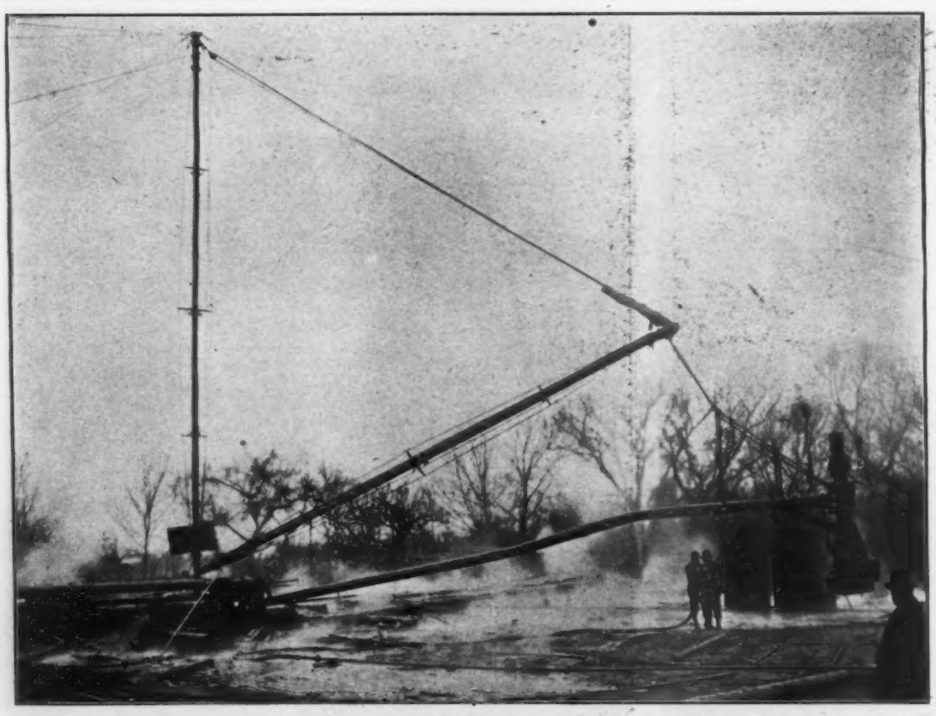
The question whether the 6 inch pipe should be allowed to drop to the bottom of the well, a distance of over 300 feet, by releasing the hold of the elevators, thus throwing the flames together in one large ascending volume and perhaps destroying the well, or whether it would be possible to accomplish the end we were working for without running the risk of sacrificing the well, was a mooted one. It was decided that not until every effort had failed should we drop that string of 6-inch.

Our next conference after trying the steam resulted in a course which was adhered to from that time on, although we modified our methods of handling the material somewhat. Between the next hood, which was destroyed, and the one which was finally successful, there was no difference in design.

The second hood was made of ¼-inch boiler plate riveted and made in the shape of a cone. It was 3 feet in diameter at the base and probably 6 feet high. At about 4 feet from the base a break in the cone occurred and from that point the cone narrowed more quickly ioward the center. Actually the hood consisted of the frustrums of 2 cones of different angles, one placed upon the other. Into the top of the smaller cone was riveted a short piece of 12-inch screw pipe and on this was a 12-inch tee, placed with the length of the tee in a vertical position. Above the tee was a nipple, a 12-inch gate valve, and another short piece of pipe. Into the side of the tee was secured a 12 by 10 swedge nipple, about 3 feet long, and from this was carried a number of joints of 10-inch screw pipe. To handle this hood and its long tail of 10-inch pipe we built a crane made of 6-inch steel pipe. The crane consisted of a mast 50 feet high and a boom of approximately the same length. Both the mast and the boom were heavily trussed to give strength, and everything about the crane was made either of steel or of iron.

Within 2½ days from the time the hood and the crane were decided upon they were both on the ground ready for the work; but to accomplish this a boiler shop and 2 machine shops were kept working day and night and 2 special trains were chartered to deliver the material as soon as it was ready to leave the shop.

On account of the cumbersome string to the hood, consisting of 150 feet of 10-inch pipe, it was thought that it would be necessary to fix the boom of the crane so that it would not swing in a lateral direction. A grade was established and about 120 feet of track laid toward the mouth of the well. A car was built and the most of the crane mounted upon it. It was proposed to lift the hood from the ground with the boom and then to advance the entire outfit, mast, hood, tailpipe and all, until the hood was directly over the mouth of the well, when the hood would be quickly lowered. We were able to advance in this manner for a distance, but the downward thrust on the track was very great. Our roadbed was new and, therefore, not well packed. The result was that a wheel jumped the track and we broke an axle. Our hood was then



probably 40 feet from the well and our mast 90 feet away. It was, however, uncomfortably warm working even at the greater distance from the well, and we decided that it would be impossible to build a suitable track to the necessary distance from the well. It was also a difficult matter to keep the mast in a vertical position and at the same time advance it, as that meant a slacking off on our rear guy lines and a tightening on our forward ones. It was decided to place the mast in such a position that it could be permanently located. This necessitated the swinging of the boom sideways and the swinging of the tail pipe. To accomplish this a swing-joint was inserted in the line. This necessitated the introduction of several ells and considerable friction resulted. These ells were later taken out.

It was on Sunday, March 4, that the plans for the second hood and crane were decided upon. On Tuesday morning at 5 o'clock our special train started from the siding of the boiler shop at Independence, with the hood on board, and on Tuesday at midnight the completed crane was placed upon a special train at Chanute. By Thursday the crane was erected, the hood in place on the track which had been built, and the entire apparatus was moved forward as above described. It was after advancing a considerable distance that our wheel jumped the track and the axle broke. At this time the movable truck was abandoned, and the mast made stationary at such a distance that the boom would be able to successfully land the hood over the well. The boom was then swung to one side and preparations made for the first trial. Accurate measurements were made, so that when swung into position the center of the hood might be directly over the center of the well. The exact measurement from the well to the mast was 57 feet. The boom was only 49 feet long, so that it was necessary to fasten from the end of the boom to the 10-inch pipe and allow the hood to extend about 8 feet further out. This was an advantage, as the weight of the hood balanced the weight of the 10 inch pipe and made it easier to swing around.

There was considerable suppressed excitement as the final preparations were made to "cap the well." There was more or less speculation as to what the effect would be when the hood came into the current of the gas as it shot with its irresistible force from the pressure reservoir lying hundreds of feet below the surface. The roar of the well was terrific and all communications had to be either written or yelled at the top of one's voice into the ear of the person spoken to; and even to do this it was necessary to withdraw to a considerable distance from the well.

At last the various crews were placed and instructions given them as to what their duties were to be. A code of signals was adopted and one man was to be stationed at some point from which he could direct the movements of the others. One crew was placed on the "crab" used for raising or lowering the hood. Another crew was to pull the hood into place by means of a guy line attached to it. Another crew was to hold back on the hood by another guy line in the opposite direction, to prevent the first crew from pulling too fast and to stop the hood when it was in position.

A signal to the crew at the "crab" lifted the hood gradually from the ground, and a second signal started it slowly and cautiously towards the well. Everything worked beautifully. The crowd of spectators was ordered back to a safe distance. Instructions had been given that the hood should be carred to within 15 or 20 feet of the well and there held for a final signal to proceed as it was thought that it might be necessary to take some further precaution to insure its successful landing. There seemed to be nothing further to do. The apparatus was working smoothly, and as planned. The final signal was given to go ahead. The tension was great. What was about to happen could not be predicted. Whether our hood would be tossed into the air by the force of the gas and landed somewhere, a bent and broken mass, or whether it would settle gently down into position as we hoped, we could only surmise. Eagerly we watched the result but our hopes for success on the first trial were not to be realized. As the edge of the hood was caught by the ascending column of gas, notwithstanding the fact that we had 2,000 pounds of steel billets attached to the outside of the lower rim of the hood, it was swung from side to side very much like the bell of a locomotive. Several times it did this, pivoting around the thread of the pipe into the tee until the thread gave way and our hood hung in a disabled condition in the flow of the gas. The chains from the boom still were attached and we were enabled to drag it to one side. Thus ended our first unsuccessful attempt. A consultation followed at the hotel that evening. We were not discouraged. We could not be. We must try again. A plan was devised which would prevent a similar recurrence. Braces were made, and in a day or two we were again ready. By Monday, March 15, two days after the first attempt and failure, we had put a harness on the hood which would hold it as we wanted. Monday afternoon, at about 4 o'clock, we had our hood squarely over the well. Our apparatus had worked perfectly and we were very much elated over our apparent success. On account of the uneveness of the baked ground close to the well, and also on account of those troublesome secondary flames which hissed out at us from every side, we were not able at first to confine all the gas to the hood, and we had to fight a fire coming from the bottom. A large gang of men was put to work piling gumbo and dirt around the base of the hood. By this means we were enabled to stop the leak round the bottom, and at about 9 o'clock that evening, when we decided to call it a day's work well done and to go home for our dinners and a night's rest, the scene which we left was one of the most satisfying I ever witnessed; where but an hour of two before, from a piece of pipe extending a few feet above the ground, had hissed forth lurid tongues of flames apparently beyond the control of any human agency, we now saw a huge mound of earth covering our hood from the top of which there rose majestically, seemingly under perfect control, a huge column of fire. Now it seemed that there remained but to close the gate valve in the top of the hood and our work was done. For several hours we had worked close to the hood and with one or two others I had climbed to the top of that pile of earth (a veritable volcano it was, but in our enthusiasm we had no fear) to examine the valve.

We had not yet sat down to our late dinner when a message came from the well to tell us that the flame had broken out from beneath the hood even worse than before—an urgent message; but as we were tired out, and as we had left a force of men to look after things, we decided to take a much needed rest.

The next morning we found to our dismay that our hood was a ruined, mangled mass; that our boom had been destroyed, and it would be necessary to commence again where we had been 2 weeks before. To add to the general wreck the wind changed, the flames burned the guy lines of our mast and it fell. New mast, new boom,

new hood, these were what were necessary before we could go ahead again. The machine shops were again started working day and night. This time $\frac{1}{4}$-inch boiler plate was used for the hood. No changes were made in the design except that a 6-inch opening was put on the side of the hood as a sort of relief to the pressure. On Monday the 19th, the new apparatus was in place ready for another attempt. By the usual method the hood was placed over the well. By this time we had become experienced, each man knew what he was to do, and it was an easy matter for us to land it.

But the gas flames, coming from underneath the edge of the hood from those side jets which had been at every turn a source of trouble, again were our Waterloo. The struggle that followed during that afternoon and evening in a vain effort to beat that flame was worthy of a nobler cause. We attempted to smother it by piling dirt and gumbo about the hood. Each man felt that it was his own personal struggle. For 6 hours, 1 shovelful at a time, we carried dirt and piled it around the hood. Crowns of men's hats were burned out, the shoulders and backs of their coats were scorched till they fell in pieces, the soles of their shoes were burned through, yet not a word of protest. They worked till from sheer exhaustion they were compelled to retire, again to renew the attack when they had sufficiently recovered. It was all to no avail. With the experience of the first hood before us, we felt that this also would be ruined; and not waiting to get it out decided to build another hood—this time cast iron was decided upon—however, we were able to recover the hood practically unharmed. During the next few days, while the cast iron hood was being made, several attempts were made, but always with the same results. Our efforts had been so handicapped by the side flames that it was decided they should be united with the main body of the flame. This could only be done by dropping the 1,100 feet of inch casing in the hole. It was the last hope. A cannon was secured to shoot off the elevators and thus release the casing. It was at about this time discovered that the links holding the elevators had been burned off, and that if they could be spread apart the pipe would drop. By this means no damage would be done to the collar at the top. A spear was made and fastened to the end of 60 feet of 3-inch pipe. The elevators were spread and the casing dropped. The relief at this change in the flame was marvellous. By means of overhead screens we could work with comparative comfort immediately at the mouth of the well. We were thus enabled to clear the ground away and make a level area about 8 feet in diameter in the center of which was the well. We sank this a couple of feet below the surface of the surrounding ground. Water was played upon it and the ground was kept soft. Several times the men working there allowed the tips of their shovels to get into the flow of the gas. They were thrown 50 feet in the air. The first time this occurred the workman hardly knew what had happened. His shovel disappeared as if by magic from his very hand, and he saw it no more. Once also a steel bar was hurled high into the air.

Up to this time only once had we got to the point of attempting to close the gate of the hood. We used an extended stem made of two joints of 2 inch pipe for this purpose. The method was too slow, and as soon as the pressure began to increase, due to the shutting of the gate, out she broke from the bottom. The extended stem was abandoned and a reel placed upon the regular stem. Upon this was wound a coil of light, flexible, stranded wire. It was the intention to have a couple of the men, the fastest runners among them, take the end of the line and run with it until the gate was closed. So confident were we now of success that on the afternoon before the final effort we had a group picture taken. Everyone present, including spectators, was invited to get into it. We went to our hotel that night making plans for getting away the next night. Most of us would not be needed there after the fire was out and very little other business had been done for a month.

It was Thursday afternoon, March 29, when we landed the hood. Not a bubble came up through the pool of water in which it was standing. The work of weighting the hood down was carefully looked after. Nothing must be neglected, for we felt that if care were exercised we were to be triumphant. Successive layers of gumbo and canvas were placed around the hood. The canvas was stretched flat and extended 12 or 15 feet away. Water was kept constantly playing over all. The canvas was also well soaked in water before it was put in place. One hundred feet of 6-inch pipe was connected to the opening on the side of the hood and the gate valve opened. Wire cables were thrown over the hood and fastened to "dead men" buried deep in the ground. These were then drawn as tight as it was possible to get them. We did not dare to cut our boom free, as in the remote event of failure we must be able to lift the hood away by means of the crane; but the boom was lowered to get it as far as possible from the flame.

At about 4 o'clock we were ready to shut the gate. We had exhausted every available means of holding the hood down. Six hundred pounds to the square inch exerted on the inside of a cone, 3½ feet at the base, has a lifting power which is considerable. When the final word to go was given to the men on the end of the wire line there was a certain degree of nervousness evident, although everybody was smiling. Two steam pipes had been hooked by means of a nipple and elbow over the top of the short piece of 12-inch pipe away from the hood and above the gate valve. If any small leak remained after the gate was closed it was intended to snuff out the flame with steam.

As the men started on their 120-foot dash across the field there was at first no apparent effect. Not until the disks had begun to throttle the opening was there a change. Gradually the flame grew less until finally with a puff and a hiss, nothing but a column of white steam was left; but by this time "things" were doing about the hood. It commenced to bob up and down and dance as if impatient at the restriction upon it. There also began to be an agitation set up underneath our carefully constructed pile of gumbo and canvas until again the forces of nature predominated and the gas broke forth through our flimsy barriers. It was not 10 seconds after the fire was gone until the gas enveloped the hood. But what cared we? Our fire was out. Five weeks of incessant battling with the apparently unsurmountable obstacles presented by a combination of the physical and chemical forces of nature had resulted in man's supremacy.

The rest of the story is quickly told. After a number of unsuccessful efforts to screw into the top of the 6-inch casing which had been dropped in the hole the well was shut in on the 8¼ casing and in that shape it stands to-day. No gas has yet been taken out of the well except for local drilling purposes and the enormous gas reserve stands available when it is found necessary to use it.

Although this was the hardest piece of work upon which I have ever been engaged, it was also the most interesting, and although the physical and nervous strain during the entire 5 weeks was most severe, I would not have missed the opportunity afforded; yet I question if I would knowingly enter upon another such battle with the forces of nature.

Note.—In connection with the reading of the paper Mr. Welch gave a series of very interesting and instructive lantern slide pictures illustrating the work.

Discussion.

The President—You have heard the paper by Mr. Welch. What is your pleasure concerning it?

Mr. Shelton—Mr. President, I move that a most hearty vote of thanks be extended to Mr. Welch for this paper. I think the American Gas Institute is indebted to the Natural Gas Association of America, and to its representative here, for having given this paper to the Institute as a contribution to its work. I ask that the same course be taken in this case as was suggested before. [Seconded.]

The President—Gentlemen, all those in favor of the motion will signify by saying "Aye." Contrary minds "No." The motion is carried. Mr. Welch, you have the thanks of the American Gas Institute for your paper.

Methods of Testing Industrial Gas Appliances.

Mr. H. L. Doherty, as Chairman of Committee on Methods of Testing Industrial Appliances, gave an extemporaneous resume of the work done in preparing the report and some of the conclusions arrived at. In closing he said:

"I move, Mr. President, that this report be accepted, and that we be given leave to amend, at the convenience of the Secretary, so that the report may appear in the proceedings. We do not want to delay its publication, but we want to pass it over from one member of the committee to another and have them all pass upon it before it is published. I make this in the form of a motion."

The President—You have heard the motion made by Mr. Doherty. Any remarks? [Seconded.] All in favor will signify by saying "Aye." Contrary minded "No." The motion is carried. I think a little appreciation for the work which has been done on this should be shown by the Institute.

Mr. W. Forstall—I move a vote of thanks to Mr. Doherty for the valuable work which has been done. [Seconded.]

The President—All in favor of the motion as stated will signify by saying "Aye." Contrary minds, "No." It is carried. Mr. Doherty will please accept the thanks of the Institute.

The Secretary—The report, as I understand, is in the hands of the committee to be returned.

Mr. Doherty—Yes.

The President—Are the Editors of the Wrinkle Department ready to submit their report?

WRINKLE DEPARTMENT.

Mr. B. McAdam—I desire to take this opportunity of thanking those who have contributed to the Wrinkle Department of the American Gas Institute, and especially to those who have contributed so generously. It is hardly necessary for me to say more, from the fact that the Wrinkles as published should speak for themselves, and there are still a few in the hands of the Editors unpublished which were received somewhat late. Inasmuch as the time for getting together the Wrinkles was very limited, it was impossible to devote the proper care in doing the work. In fact, so much so that we had scarcely time enough to look over some of the contributions before sending them to print. I do not think it necessary to do any reading, as I presume you will all read them over for yourselves. On account of the hurry there may be some errors which have crept into the work, and we ask you to kindly overlook these things under the present conditions.

Editors McAdam and W. E. Steinwedell then submitted the following Wrinkle budget:

Scurfing Retorts.—By Mr. George S. Carson, Iowa City, Ia.—The photograph shows a very simple and inexpensive method of taking carbon out of retorts by using a No. 1 Emerson pressure blower, located directly in front of the retort at a distance of about 9 feet, to prevent the motor from getting too hot. By connecting this apparatus, with a galvanized iron pipe, to a 3-inch cast iron pipe, which is laid in the bottom of the retort, extending about half way back, then by bricking the retort mouth two-thirds full, the carbon can be all burned out, as well as the standpipe thoroughly burned out, in from 6 to 8 hours time. The power required is about one-sixth of a horse power and the cost of operating nominal. The work, however, is thorough, with no damage to the retort. [See Fig. 1.]

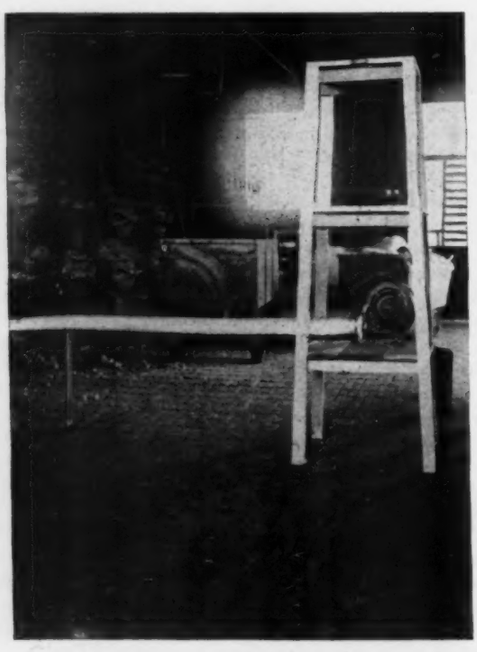


Fig. 1.

Inspecting Bench Heats.—By Mr. Henry Rochat, Indianapolis, Ind.—We have taken the sight plugs of the stoppers out of the nostril holes and replaced the plugs with a piece of mica and setting it in cement, making an air-tight joint. In taking great care in cutting the mica you can see your heats very nicely, and a good view of the interior of the bench and flues is obtained. By making several observations of the color of the heats the foreman is enabled to detect any variation at once, as it is customary for the foreman of each shift to make the rounds and observe the heats frequently. It is also convenient for the officials, when passing through the retort house, to make an examination with very little time.

Ventilating Retort House.—By St. Paul (Minn.) Gas Light Company.—For ventilating the retort house a line of galvanized iron pipe, 6 inches in diameter, is run along the wall opposite the benches, shoulder high from the floor. Outlets are provided at suitable distances apart, so as to direct the fresh air out into the room, the air being supplied from a blower connected to the line of pipe outside. This has been found very efficient in providing ventilation during the summer months, in addition to the ventilation for carrying off the smoke and fumes at the top of the house. Each outlet has a shut off valve, so that the currents of air can be easily controlled.

Chart for Charging Retorts.—By St Paul (Minn.) Gas Light Company.—This chart is framed in a conspicuous place in the retort house for showing the men the time of charging the retorts. The frame has a protection from dust and dirt, and the chart can be easily removed when changes in the schedule are desired. It is easily read, and is of assistance to the men in keeping track of their work in charging and drawing. The figure shown is for 10 benches of 9's, running 4 hour charges, 3 retorts being charged at a time. [See Fig. 3.]

Temperatures in Water Gas Operation.—By Mr. W. A. Baehr, St. Louis, Mo.—At station "B," Laclede Gas Light Company, we have recently installed a pneumatic pyrometer with recording device, which we are using in a series of tests conducted with a view to learning more about the manufacture of water gas and the effects different tempertures and pressures have upon the quality and quantity of gas made.

The pneumatic pyrometer used is manufactured by the Uehling-Decker Company, Passaic, N. J., and depends for its action on the velocity at which air at different temperatures is drawn through a small hole. A constant suction is produced by a steam jet, and the air, after being heated in the fire tube, is passed through a small opening, cooled and drawn by the steam suction jet through a second opening of the same size. A water column is so arranged that a direct reading of the temperatures is obtained by the relative velocity of the passage of the air through the 2 small openings. This pyrometer is arranged to register the temperatures at the top of the middle third of the fuel bed of the generator, and the attached recording gauge keeps a permanent record of the temperature, which varies from 2,000° F. to 2,500° F., but drops to about 1,800° before clinkering.

The temperatures at the bottom of the middle third of the fuel bed of the generator are indicated by an electric pyrometer, which indicates from 800° to 900° F., in ordinary operation. This instrument is manufactured by Charles Englehard, No. 41 Cortlandt street, New York. In this apparatus a platinum and iridium wire are fused together and inserted in a porcelain fire tube. The electrical current generated by the heat is indicated by the needle of a voltmeter, which is so graduated that temperatures may be read direct.

With these devices experiments are being carried on showing how the temperature varies for different leugths of blows and runs; or, *vice versa*, how the blows and runs must be varied to keep the temperatures within certain limits. At the same time series of samples of blast gases and blue gas are taken at regular intervals, one sample being taken each minute during a blow and the following run. The analysis of the blue gas indicates the value of the gas made during each minute of the run, while the percentage of carbon dioxide and monoxide in the blast gas samples gives an idea of the efficiency of combustion during the blow. The amount of gas made during each minute of the run is determined by observations made on the relief holder. In addition to investigating the effects different intervals of runs and blows

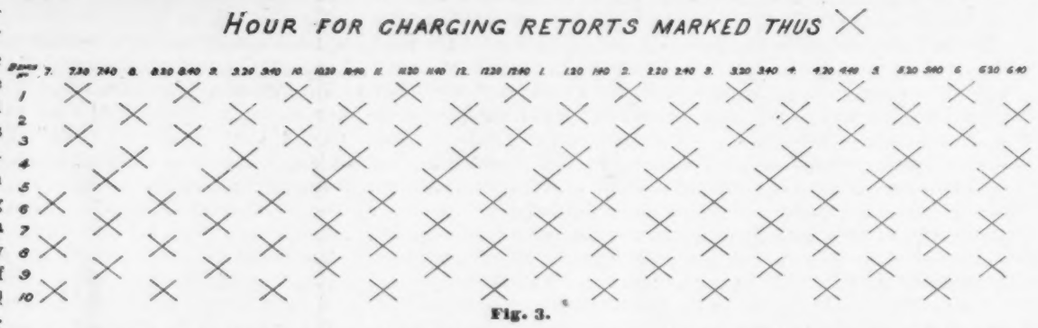
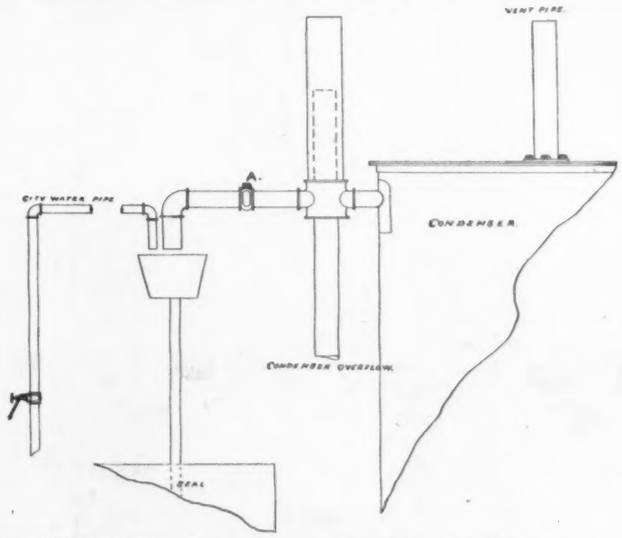


Fig. 3.

have upon temperatures, tests are being made to ascertain the effects of different steam pressures upon temperatures and upon the amounts and qualities of gas produced. An idea of the efficiency of the set with steam at different nozzle pressures and at different temperatures is obtained by the methods outlined above. In this case, however, the experiments are carried further by passing a measured amount of gas through calcium chloride tubes, which absorb the undecomposed steam, and show the relation between the amount of steam actually used in the manufacture and the resulting quantity and quality at different pressures and temperatures. At present the experimental work is being confined to the generator, but after this has been thoroughly tested we intend to follow it up by a similar investigation of the conditions which exist in the carburetter and superheater.

Supplying Hot Water to Seal of Water Gas Apparatus.—By Edmund Cathels, Providence, R. I.—This arrangement aims to reduce the variation of flow of water from condenser into seal pot to a minimum, at the same time allowing the supply of water to condenser to vary to a fairly considerable extent; the supply of water from condenser to seal pot, under this arrangement, is under a constant head, and once the stopcock "A" is properly adjusted it never need be altered. The flow of water into the seal pot is always in full view of operator.

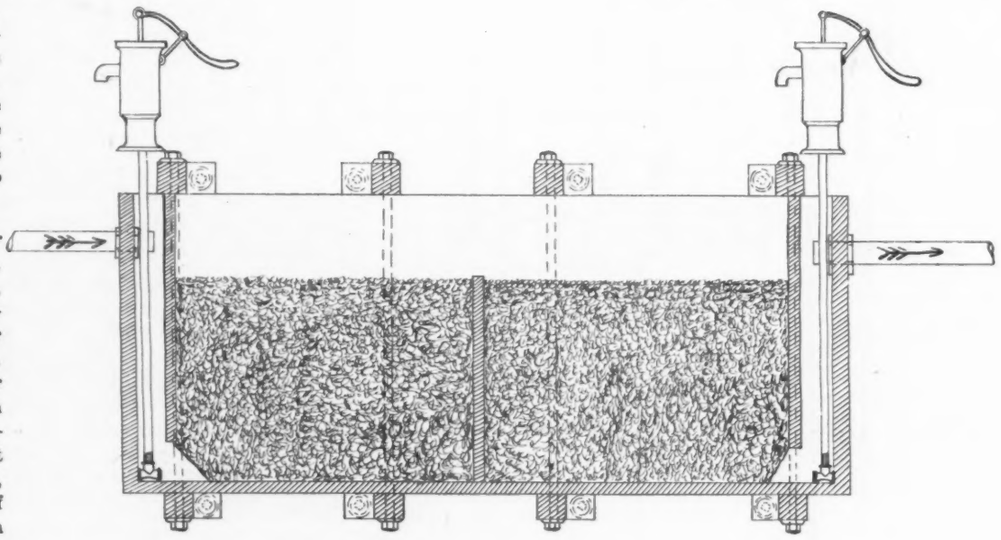


ARRANGEMENT SHOWING SIGHT FEED WATER INTO SEAL POT FROM CONDENSER IN WATER GAS PLANT.

Fig. 6.

It is also advisable, however, and even necessary, for emergency, to have some other means of supplying water to seal pot, and a city water supply, or some other reliable supply, should be run with a quick opening valve located at a point convenient to operator. [See Fig. 6.]

Filter for Overflow of Water Gas Tar Separators.—By Mr. Edmund Cathels, Providence, R. I.—A good and simple filter arrangemeut, following tar separators, is shown in sketch. The pumps are used whenever it is desired to test the condition of filter, and also for the purpose of pumping any tar that may have carried over that far, thereby prolonging the life of material, and keeping same in good working condition. Two filters as above shown, each 4 feet wide by 4 feet 3 inches by 15 feet long, each containing 220 cubic feet of coke, were in use for nearly 7 months, without the need of changing coke, and in the time mentioned passed an effluent from a water gas plant that made 450 millions cubic feet of gas, besides taking care of all drips around the plant, and drips on distributing system. [See Fig. 7.]



FILTER FOR EFFLUENT AFTER PASSING WATER GAS TAR SEPARATORS.

Fig. 7.

Tar Burner.—By Mr. G. I. Vincent, Des Moines, Ia.—This burner, as shown in the cut, is made up of ordinary fittings and is constructed as follows: A 1-inch nipple is cut off square and a light cut taken out of the inside on the lathe. A ½-inch coupling is then screwed on to a ½-inch nipple and placed in the lathe and a light cut taken off the coupling so that it will make a forced fit inside of the 1-inch nipple. The 1-inch nipple is then ground on with emery so that it makes a tight joint between the coupling and the nipple. The coupling is removed and 2 or more $\frac{5}{32}$-inch holes are bored through the coupling for the tar, and longitudinal slots for the steam are filed from one end of the coupling to the other, so that the hole comes in the bottom of the slot. This is all the machine work required on the burner, which is made up of fittings as shown. In action the tar flows through the 45° ell and out the $\frac{5}{32}$-inch holes. The steam flows into the ⅜-inch ell and out through the slots filed in the ½-inch coupling. The burner is connected up in the usual way, the steam and tar connections running through a large hole cut in the front of the boiler just beneath the shell, and the burner is set pointing downward at an angle of 45° or more. The best results are secured by removing the grates and excavating the ashpits to a depth of 1 or 2 feet and arranging a false grate of firebrick in the bottom of the excavation and also walling up the doors, leaving only such openings as are found by experiment necessary to admit the proper amount of air for complete combustion. If the burner stops up, due to improper screening of the tar, it can be easily cleaned by removing the ½-inch plug. [See Fig. 8.]

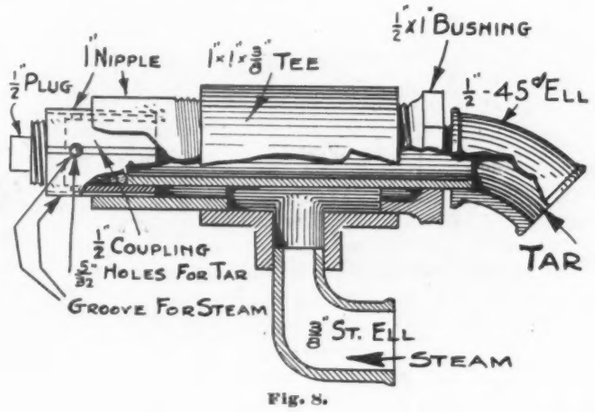


Fig. 8.

Pressure Gauge.—By Mr. James H. Walker, Milwaukee, Wis.—The sketch shows a home-made gas pressure gauge for either foul or clean gases, but especially suited for the former, the entire absence of glass tubing making it substantial and avoiding the necessity of taking readings through a stained and dirty glass. The siphon *A* is made of 1¼-inch iron pipe, fitted with draw-off cock *B* and filter *C*, as shown. The scale case *D* is made of heavy tin and slips over the cap *E*. The scale *F* is made of paper or other material, and marked off in spaces as shown, each ¼-inch representing 1 inch of pressure, and fastened in a suitable manner to the inside of the scale case. Sketch B shows float and indicator *G*, enlarged for convenience in illustration. The float *H* is made of tin, the stem *I* of No. 12 wire, the same passing through the conical shaped hole *J*. In case of a sudden rising of pressure the conical top of float *H* is thrown in contact with the countersink opening in cap, thus preventing over flow. The principal advantages claimed for this Wrinkle are cheapness, durability and cleanliness, and adaptability to both foul and purified gases. [See Fig. 10.]

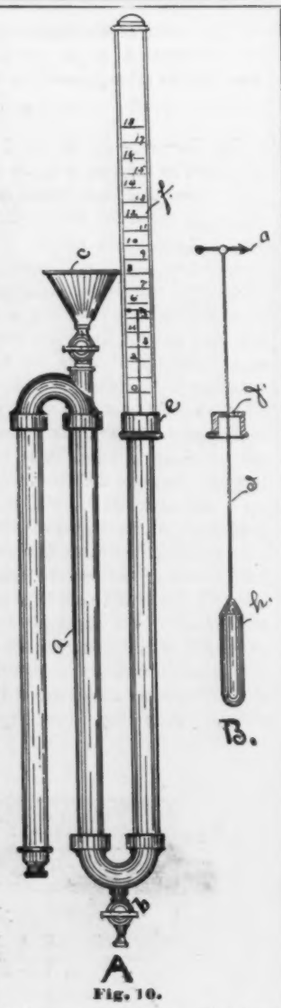


Fig. 10.

Electrical Pressure Alarm.—By Mr. Edmund Cathels, Providence, R. I.—The float, brass rod, and cross bar *C* and *A* and *D* are all soldered up together, as if in one piece. The guide columns are made of glass tubing inserted in holes drilled in wooden cover. Glass columns are about ¼-inch outside diameter, and a wire brace keeps them equi-distant on top. The brass guide blocks are drilled so as to slide up and down glass rods. The brass stops *BB* are set at any desired point, by inserting a piece of rubber tape between the stop and glass rod, connecting posts tapped into them for connecting wires. By connecting gauge as shown, using stopcock *E* for mouth piece, the exact pressure at point of alarm can always be obtained, by blowing at point *E*. The location of push button, as shown, will always prove the condition of batteries. It is almost needless to say that this arrangement will give an electrical alarm for any pressure or vacuum within its limit, that may be desired. [See Fig. 11.]

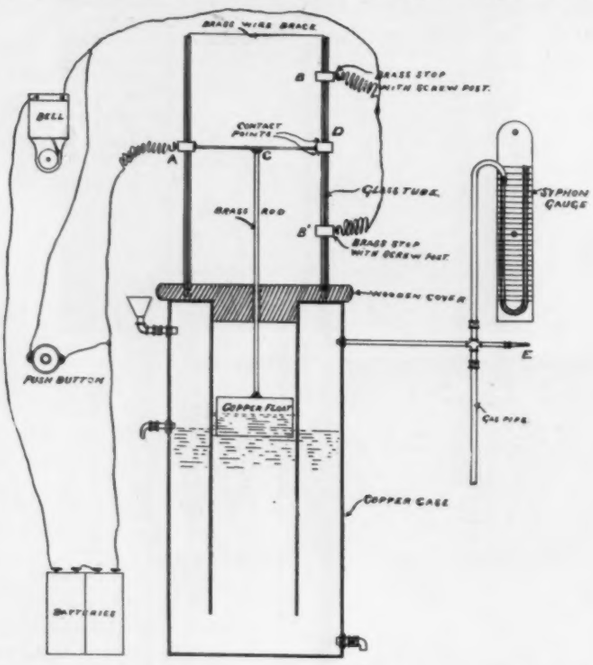


Fig. 11.

Electric Pile Driver for Foundations.—By Mr. George S. Carson, Iowa City, Ia.—The picture is of a motor-driven, pile driver which we rigged up to drive the piling for the foundation of a 150,000-foot steel gasholder we are putting in. With this outfit we drove 556 cedar piling in 11 days, one-third of which were 14 feet long and the balance 12 feet; they were all driven within a 70-foot circle to support an 18-inch concrete foundation on which the steel tank will rest. To have driven these piling with a horse power outfit would have taken nearly 40 days. This may be boosting the electric power business, but we operate both gas and electricity here, so one hand can wash the other. [See Fig. 12.]

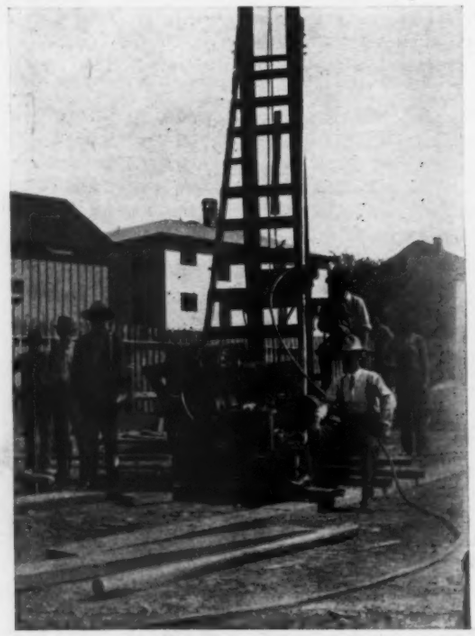


Fig. 12.

Automatic Control of Ammonia Stills.—By Mr. F. E. Sheriff, Vincennes, Ind.—Thermostats for the control of temperatures on ammonia stills have been in operation for some time and are proving very successful. They will control the temperature at the inlet of absorber within 2°, and should the feed pump stop for any reason, the regulator will automatically shut the still down. The regulation is attained by means of a regulator, placed at the top section, which operates a valve in the steam line into the still. Compressed air or water pressure is the motive power used for operating the steam valve. A small hydraulic air compressor may be used if water is dirty. By means of this regulation liquor of a certain strength is more readily obtained, and close observation of the thermometer is avoided.

Filling Holder with Air.—By Mr. L. C. Graham, Winona, Minn.—Owing to the location of our new 200,000 cubic foot holder it was practically impossible to fill it with air for testing with any apparatus we had. A steam jet was constructed at a very slight expense and worked successfully. We used a 1-inch pipe to convey the steam into a 3-inch pipe, which was connected to the top of the inlet drip pot. The end of the 1-inch pipe, which entered the 3-inch pipe, was reduced to ½ inch. The supply of air was controlled by a 3-inch valve on the end of the 3-inch pipe, and the holder raised about 3 feet per hour. A pump with a metal valve was used to keep the drip pot clear of hot water.

Safety Devices.—By Mr. Paul Doty, St. Paul, Minn.—All workmen should be safeguarded against accidents, and security of life and limb is the first essential of civilization and progress. Many accidents are avoidable, and safety and security should be provided for installations of boilers, motors, power transmissions, elevators and hoisting apparatus, transportation and filling of acid tanks, etc. Safety lamps, respirators, ventilators, air purification apparatus to prevent inhalation of

dangerous gases, etc., are all to be recommended. The respirator shown covers and protects the mouth and nose against dust, etc. It contains filtering cotton to purify the air inhaled and flaps of mica for the overflow of the exhaled air. The goggles are to protect the eyes. The oxygen apparatus has a discharge of from 1 to 10 quarts per minute and is provided with a water or medicated vaporizer, The complete asbestos suit with isinglass face protector is used when necessary to be near excessive heat. [See Figs. 15.]

Fig. 15.

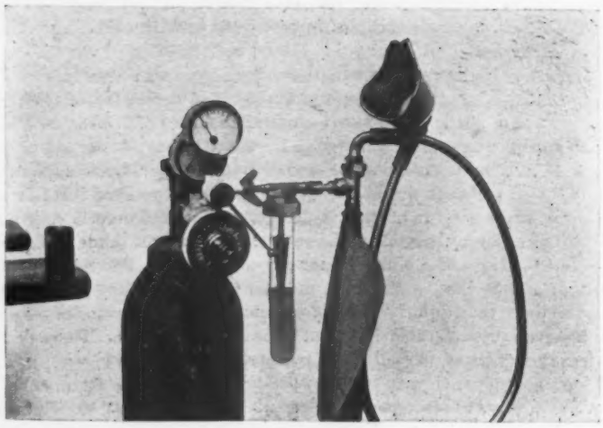


Fig. 15.

Quick Estimation of Sulphur in Coal.—By St. Paul (Minn.) Gas Light Company.—By this method one can be ready for the precipitation portion of the test in a few minutes, instead of the slow heating for 3 or 4 hours in a platinum crucible over an alcohol flame. A sample of the coal to be tested, pulverized to pass a 100-mesh screen, and weighing ½ gram, is mixed with 10 grams sodium peroxide (Na_2O_2) and ½ gram potassium chlorate ($KClO_3$), the latter two weights being approximate. The method of mixing the charge is to place the weighed sample of coal in the cylinder shown in the figure. Mix it by means of a wire with the $KClO_3$, and then add the Na_2O_2, using a certain measure which you have found amounts to 10 grams, mix quickly with a wire and close the cylinder by screwing on the cap. Avoid exposing the Na_2O_2 to air unnecessarily, as it changes its structure. It is best to use either brass or copper in handling this, avoiding contact with paper, which it would ignite. The charge in the cylinder is ignited by connecting the two terminals *T* and *t* to a battery of 4 dry cells. The charge is burned at once, removed from the cylinder, dissolved with hot water, and the analysis completed in the usual way by adding HCl and precipitation with barium chloride. The cylinder shown in the figure is of brass, about 1 inch inside diameter, ⅛ inch thick and 4 inches long. It may be made from a piece of brass pipe, capping both ends, or by boring out a brass rod and capping the open end in such a way that it may be readily removed for putting in the charge. One of the rods inside the cylinder is insulated from the outside shell, while the other is in electrical connection with it, the rods being joined at their inside terminals by the fine wire *W*, which is about 64 gauge, and becomes heated when the battery is attached.

Fig. 15.

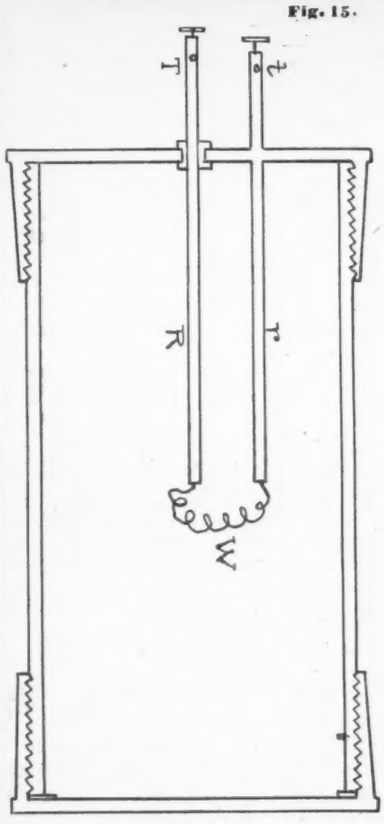


Fig. 16.

The shorter method gives greater accuracy than the longer test. [See Fig. 16.]

Holder Heights at Night.—By Mr. C. H. Gifford, New Bedford, Mass.—Six-inch figures are painted on the side of holder, spaced 6 inches apart. There is a target or pointer mounted on the holder tank to read 5 feet above the water line, and there is an electric lamp mounted on a rail of the holder tank, one wire being connected to the lamp and the other wire carried to a single pole switch at a convenient point in works.

Sampling Flue Gases.—By Mr. E. W. Gutsche, Everett, Mass.—Finding it necessary to take flue gas samples 3 feet back from the peep hole in a retort furnace, I experienced difficulty in finding a tube which would withstand the high temperature, using material at hand. After some experimenting, I found that a piece of good ignition tubing, tightly wound with asbestos wicking, served the purpose very well. The ends of the wicking can be fastened with a little fireclay which, when baked, firmly holds the wicking. A piece of ignition tubing ¼-inch in diameter thus wound with the asbestos, makes a cheap, handy and very serviceable tubing for sampling gas where temperatures are high.

District Pressure Booster.—By St. Paul (Minn.) Gas Light Company.—Two districts across the river, *L* and *H*, from the works *W*, are supplied by 2 feeder mains of 6 and 8 inches diameter, respectively. District *L* is lower than the works, while *H* is high. Although pressures in *H* were were good, it was found difficult to maintain pressure in district *L* at hours of maximum demand. To correct this a blower, direct

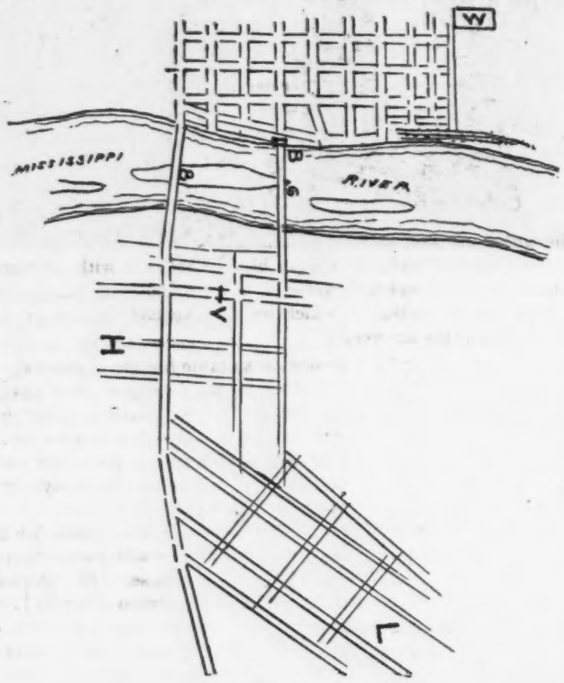


Fig. 18.

connected to an electric motor, was cut in the 6-inch main at *B*, and the pressure at that side of the bridge raised to 9 inches, giving about 5 inches on the opposite side. The pressures are now satisfactory. *B* is about a mile from the works. The 6-inch main is connected to a large 12-inch main at both ends, giving sufficient capacity of gas to prevent any pulsation being noticed. The valve *V* prevents gas backing through the 8-inch feeder. [See Fig. 18.]

To be Continued.)

A Report on Vertical Retorts.

The *Journal of Gas Lighting* says, in connection with the subject named in the heading: Some time ago a deputation of Belfast City Councillors, together with Mr R. Sharpe, the Assistant Gas Manager, were appointed to inquire into the question of vertical retorts; and their report on the subject was presented at the last meeting of the Council. In drawing attention to it, Mr. J. A. Doran, the Chairman of the Gas Committee, pointed out that a waiting policy was advised, so that they might reap the advantage of the experience of those experimenting with this form of retort.

The report says that for many years retorts set vertically have been, and are now, almost exclusively used in the shale oil industry of Scotland. As early as 1828, and at intervals since, their application for the distillation of coal producing illuminating gas has been tried, and as often given up as impracticable. Carbonizing coal in bulk in large chamber ovens for the production of coke and gas, is now being tried with encouraging results. It is, however, only within quite recent years that the vertical retort in relation to gas manufacture has been revived experimentally, and by reason of the increased chemical knowledge of the destructive distillation of coal now available, has made rapid strides, and achieved such a measure of success in England and Germany that at least three systems have emerged from the improving to the practical stage. It would be misleading to say that in any one of these three systems all difficulties have been overcome; but sufficient progress has been made to warrant the investment of large capital in the adoption of at least one of them—viz., the Bueb system at Cologne. The difficulties that remain are chiefly of construction and regulation of temperature, and these the inventors are hopeful of surmounting.

The method of charging divides the three processes referred to into distinct classes: (1) At Bournemouth, the Woodall-Duckham—Continuous carbonization in completely full retorts, combined with an ample and, to a certain extent, obligatory admission of steam. (2) At Berlin and Dessau, the Bueb—Intermittent carbonization in completely full retorts, with a limited and arbitrary admission of steam. (3) At Exeter, the Settle-Padfield—Continuous carbonization in a partly empty retort, combined with gasification of the tar vapors.

Taking them in the order given, the deputation first visited Bournemouth, and were very kindly received by Mr. Harold Woodall, the Engineer of the Gas and Water Company, and his assistant, Mr. Philip Moon, who explained the working of the retorts (which at the time of the visit were out of action).

The trial setting consists of 4 retorts, 20 feet long by about 24 inches by 10 inches in cross section at top, and widening out downwards to facilitate discharge. Combustion of the furnace gases heating the retort takes place at the top, which is highly heated, reducing in temperature towards the bottom. The coal is broken small and elevated by a conveyor to an overhead hopper, which feeds the coal continuously as required. This is accomplished by a simple, effective, and gas tight cylinder revolving slowly, and connected by down pipes to each of 2 retorts, and a bottom conveyor which removes the coke. The 4 retorts end in a hopper sealed in water, and the coke is deposited on the conveyor, which rapidly removes it outside. In this way, the coke is quenched, and more or less saturated with water. Over saturation is avoided by the high speed conveyor. The quenching produces steam, which, rising through the hot coke, makes water gas, and travels, together with the coal gas produced, to the upper part of the retort. Much more gas per retort and per ton of coal is thus made than by any other system. During 2 months' continuous working—to show the capability of the system—a make of 18,000 cubic feet per ton of coal was obtained, but necessarily of low calorific and illuminating value—11 to 12 candles.

The following are some particulars of the working: The trial retorts, over 8 months' continuous work, produced 13,000 cubic feet of 14-candle gas per ton of coal. Each retort carbonizes 3 tons of coal in 24 hours. Carbonizing wages are estimated to work out about 7d. per ton of coal in a 1½ million installation, or rather over ½d. per 1,000 cubic feet. Only 3 men per shift would be required in the above-sized installation. The tar made per ton of coal is 14 to 16 gallons. There is very little naphthaline or cyanogen in the gas. The ammonia made is an average of 59 gallons of 8-ounce liquor per ton of coal. The retort for the bottom 15 feet may be taken as indestructible, and the life of the top part as more than equal to that of horizontals. The amount of sulphur in the gas is considerably less than in ordinary coal gas. There is considerable saving of ground space required to produce a given quantity of gas, as compared with horizontals. For example, a 1½ million installation (say, 10 settings of 4) needs 120 feet by 32 feet; or, if settings of 8, 60 feet by 41 feet. No retort house is required, only shed-roofs over the conveyor and gangway. The retorts and all connections being always closed, there is no smoke or dirt. There are no stopped ascension pipes, and hydraulic mains are dispensed with. The men can work in absolute comfort. The retorts can be erected—including cost of installation and royalties—at the same price as horizontals, using charging and drawing machines, per 1,000 cubic feet made.

At Bournemouth they saw 4 settings of 4 retorts (improved) being erected. At Liverpool and in London works, they are erecting 2 settings of 4 retorts each. All the installations are to be ready for operation in December of this year.

The deputation next visited the Mariendorf works of the Imperial

Continental Gas Association, and were very kindly received by Herr Körting, the Chief Engineer, who explained the working of the system, and had several retorts drawn and charged in their presence.

The bench contains 12 retorts, 24 inches by 12 inches by 16 feet 6 inches high, with top and bottom mouthpiece and self sealing lids. There is no mechanical feeding, the retort being filled at one operation from a travelling hopper containing the charge (12 cwt. of broken coal), and operated by one man. The duration of the charge is 12 hours, yielding 15,890 cubic feet of gas per retort and per day of 24 hours, and 12,380 cubic feet per ton of coal. These are the average results obtained during the month of February last, the calorific power per cubic foot averaging 576 B.T.U. The volume of gas obtained varies with the class of coal used. The retort is emptied by removing the bottom lid, when the coke slides in a heap into a barrow and is quenched by a water sprinkler. Small quantities of steam are admitted uniformly to the retort, to keep the deposit of carbon in check. Unlike the Woodall-Duckham retort, combustion takes place at the bottom, which is highly heated, reducing towards the top—the furnace gases passing off at 300° C. The fuel used is about 16 per cent. of the coal carbonized. The whole apparatus and operations are extremely simple, the work light, and no skilled labor or training is required. The retorts have stood the test of 9 months' continuous work without losing form. Herr Körting is so satisfied with their work that he intends putting down a large bench in their new retort house next year, in preference to the inclines now used.

The following advantages are claimed for this system: High make of gas on a minimum area of ground. High make of gas per ton of coal of uniform quality. High make of gas per retort. The gas contains almost no naphthaline, and 40 to 50 per cent. more ammonia. The tar is thin and rich in valuable oils. Stopped ascension pipes are unknown. No burning of carbon is required. Retort house work is considerably reduced, the retorts being charged only every 10 or 12 hours. The coke is large and hard, therefore less breeze is made.

This system has made greater progress than either of the others in being adopted on a working scale, the following installations being either already in action or to be so this season: Oberspree, near Berlin (for the Imperial Continental Gas Association), 5 settings each of 10 retorts, 16 feet 6 inches high—50 retorts. The Dortmund Gas Works are to be reconstructed with 10 settings of 10 retorts each, equal to 100 retorts. The Dessau Gas Works (for the German Continental Gas Company) are being extended, and all their output is to be derived from verticals. Potsdam, near Berlin, are to make half their output this season from verticals, and the second half in 1907. At Barcelona, 15 vertical settings of 10 retorts (150 retorts) for the extension of the works are to be in use this season. At Mariendorf (Berlin), as already stated, a large installation is to be erected next year. On their return journey the deputation visited the Cologne Gas Works, belonging to the municipality, where there was being erected the largest installation of the Bueb system—viz., 4 benches, each containing 6 ovens of 10 retorts, or a total of 240 retorts, with coal storage on either side, which Herr Knottebrock, the Resident Engineer, informed them was to cost 1,500,000 marks (about £75,000 sterling), this cost including the retort house, 223 feet 9 inches long by 129 feet 3 inches wide, and 2 chimneys.

The Settle-Padfield system, at Exeter, though not visited, is referred to. The retort is a combination of the vertical and inclined, fed continuously by an ingenious but cumbersome arrangement of cones and plungers. The retort is not filled completely, as are the Bueb and Woodall-Duckham. A large portion of the vertical part is left empty and kept at a high heat, with the object of gasifying the tarry vapors. The discharging is done by hand, a portion being withdrawn every 2 hours.

At Cleethorpes, 6 retorts were erected last year, and the Engineer in giving his experience of them says that, after working the apparatus in various ways, he was disappointed to find that it was not practicable to fully carbonize the coal when charged into the retort in pinches, unless left in several hours after the retort was full. The most suitable method of working, he found, was to fill the retorts with coal by means of the plungers, as quickly as possible, and then to let the coal remain in the retorts for a time sufficient to fully carbonize it. For working retorts in this manner, he found it an improvement to do away with the plungers altogether, and fill the retort direct from a measuring chamber by means of a shoot. As far as he had gone, he had got 12,000 cubic feet per ton of coal. The contract guarantee was for 13,000 cubic feet of 15-candle gas per ton of coal, and that the fuel used in heating the retorts should not exceed 15 per cent. of the coke made. He remarks that the coal has a tendency to hang to the sides and round the plungers of the retort, and not fill the whole area of the retort. The coke also adheres to the retort sides, causing difficulty in getting it out—there being no proper means of reaching the coke stuck in the upper end of the retort.

The deputation summarize their impressions as follows:

1. The Woodall-Duckham sytem claims to have many advantages, including a great saving in labor. A disadvantage in the system is the risk of the coal and coke conveyor breaking down. But the advantages are so great that the risk is worth taking, and by arranging the driving power in sections, the chances in this respect may be reduced to a minimum, and, at the worst, hand labor during temporary stoppages could be resorted to. If all the advantages claimed can be justified by the working of their latest improved settings at Bournemouth, Liverpool and London, the system is worthy of adoption. Had we ground space on our works, a trial setting would have been desirable, to gain experience of the most suitable coal.

2. The Bueb system has the merit of extreme simplicity. Beyond the conveyor, there are no mechanical charging or discharging appliances, and therefore no chance of a breakdown on this score. Labor is reduced to a minimum; two men per shift operating 60 retorts. In charging as at present arranged, some smoke is produced, and constitutes an objection which would not be difficult to overcome. But as these retorts are charged only every 10 or 12 hours, instead of our 4 or 5 hours, there would be a gain in this respect of about 50 per cent. over our present method. This, we believe, could be entirely overcome by a gas-tight arrangement of hopper. This system has been more largely adopted than the other two.

As the improved plants of both systems in England and Germany are to be in action this season, we anticipate a large crop of experience and reliable results, which may further demonstrate the already undoubted advantages of verticals over horizontals and "slopers;" and we believe the Committee would do well to keep a perfectly open mind to the merits of the only two systems as yet in the practical stage.

Gas Coke in Heating Stations—A German Inquiry.[1]

The questions addressed by the Heating Committee of the German Gas Association to various central heating stations with reference to the use of gas coke, as briefly referred to in our issue of 8th September last, were the following, to which we now append a statement of the general effect of the answers:

1. Is gas coke found to be generally suitable for use in central heating stations? Only 4 firms replied in the negative; one gave no reason, three objected to slag. Fifty-five firms replied "Yes," without qualification, and among these 9 found gas coke as good as oven coke or better; while 24 other firms thought it not as good, there being more slag, or on account of its want of uniformity in quality. Some insist upon a more careful sorting out into sizes.

2. Does gas coke from different coals (Saar, Ruhr, Saxon, Silesian, English, Bohemian) present any differences in usefulness, and if so, what? In most cases considerable differences were set forth: but many firms did not know the origin of the coal from which their supply of gas coke was derived. Coke from English coal was most in favor; then Ruhr and Silesian; the others were too slaggy, and Bohemian was least in favor.

3. What kinds are available without further treatment? Some say none, some say all; most say that all kinds are available with results which themselves depend upon the quality of the coke.

4. In what kinds of coke does the quality (hardness, specific gravity, ash, and earthy matter) need to be improved? The answers, taken all over, show that there is a demand for greater hardness, less ash and earthy matter, less slag formation, freedom from dust and slack, and suitability of size. The committee, admitting that gas coke is lighter and more porous than oven coke, point out that boiler hearth makers are now quite overcoming this disadvantage; and if vertical retorts come into extensive use, this difficulty will disappear. Softer coke tends to make dust and thus block the fire and make slag, but greater porosity is not entirely a disadvantage, since it enables the fire to be worked with a smaller draught; and coke from vertical ovens and chambers seems to be just the thing required. The earthy matter from the coal presents itself in the coke, baked to a stone; and the pieces of this stone block the fire. Such earthy matter is mostly associated with those large lumps of coal which many gas works prefer as being most convenient for storage. There is no doubt, however, that well washed nuts, such as are most suitable for conveyors, contain less of the earthy matter than pit coal as brought up to the surface; and gas works using nuts might do well to reserve the coke from these nuts for sale to heat-

1. The *Gas World*.

ing stations. If coal be used in lumps, the percentage of earthy matter and ash should be looked after, else there may be complaints. The same remark applies to the percentage of ash. Well washed nuts give the least ash; and the ash may, or may not, be of such a character that it readily runs into a slag, the removal of which causes great difficulties, as gas works themselves know from their experience with producer firing. In producer firing these difficulties have been overcome, and it remains for the central heating stations to take some lessons from gas works experience, as most of them have already done. The ash from Saxon coal is very fusible, forming a glassy slag which attacks the boilers. Ruhr coal gives the least fusible ash; English, Saar and Upper Silesian coal stand intermediate. The want of uniformity of coke from one and the same works is very much complained of; and the committee strongly recommend that gas works should ascertain and communicate to the heating stations the heating value, the percentage of ash and the fusibility of the ash of the successive batches of coke supplied by them. The sorting of coke into sizes is also complained of, and in some cases it is said that coke has been delivered which had been saturated with rain, and frozen hard. The sizes which are in request for boiler purposes are, according to the size of the boilers, 1.2 by 2, 1.6 by 2.4, and 2 by 2.8 inches. Modern gas works do store their coke carefully, but the committee remark that it is not to be denied that some gas works are very primitive in their arrangements. The coke should be stored on a cement floor, kept dry, and not allowed to freeze; and for heating stations it should be as freshly made as possible.

5. Is gas coke usable and to be recommended in your system of boilers without modification? This question was for the most part answered in the same way as No. 1, with observations. The result was quite favorable to gas coke of good quality.

6, 7, 8. Are there any disadvantages connected with the use of gas coke in your system of boilers, and, if any, what? Are any alterations required in your boiler system to adapt it to the use of gas coke, and, if any, what? Do you recommend water cooled tubular fire bars, or any other system for facilitating the clearing away of slag? The principal requirements noted were the greater space required by the lighter coke; proportioning the hearth area to the heating value of the gas coke; larger fire doors to facilitate clearing out of slag; circulation of water round the fire to prevent slagging; and water cooled fire bars.

Conclusions.—A. For gas works.—Distil coal in bulk as far as possible. Use well-washed nuts. Test the coal regularly for ash; avoid coal containing too high a percentage. Test the coke regularly for its heating value, ash, and the fusibility of its ash, and report these to the heating station companies. Supply coke of uniform quality. Carefully sort the coke into sizes. Carefully store the coke. Attend to the good condition of the coke sent out to heating stations.

B. For boiler users.—Proportion the boiler area and the free fire-bar area to the specific gravity, the heating value and the ash percentage of the coke. Proportion the fuel space to the specific gravity and heating value of the gas coke. Have the fire doors large enough to enable slag to be easily dealt with. With free boilers circulate water round the fuel. With gas coke containing fusible ash, and with boilers not too small, use water-cooled tubular fire-bars.

If gas works and boiler users endeavor to meet one another in the above ways, the committee have no doubt that gas coke as a fuel for use in central heating stations will come into great and increasing use.

In Bakeries.—At the last meeting of the German Gas Assoctation, Herr Reichard, of Carlsruhe, narrated that in Carlsruhe gas coke was coming into extensive use in bakeries. They had in that town 30 bakeries, on the most widely differing systems, and gas coke had worked well all round. The alterations required had proved quite unimportant. The gas undertaking had co-operated with the 2 bakery oven builders in the place, giving them a small premium in each case where the baker was found to have used gas coke continuously for 12 months. These bakeries, which have been partially using gas coke during the past 6 or 7 years, each take from 20 to 40 tons of coke per annum. There are larger bakeries in the town, but the gas works have ceased to push gas coke upon bakeries since their power of supply is inadequate, the central heating stations taking the bulk of the coke. The police make the bakers either put up a chimney 100 feet high, or else use coke; so that they do use coke and not coal. Herr Kobbert, Königsberg, referred to a published lecture by Dr. Ascher, of Königsberg, upon the smoke nuisance and relative legislative police regulations in England and America; and to recent scientific investigations made at Königsberg, which show that not only chronic, but acute lung troubles, may be directly caused by the smoke nuisance, with fatal results. Herr Erpf, of Pforzheim, said he had been successful in inducing the bakers in his town to mix coke with their coal. At Pforzheim the bakers use both under-heats and over-heats, and their practice has been to use a gaseous coal to make flame for the over-heats. Coke alone would not do what was required. With the mixture, however, the coal burns very clearly and completely.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

"O. R. M.," writing to the JOURNAL under date of the 29th ult., notes as follows respecting the new up-to-date illumination on East North avenue, Chicago: "The best lighted street in the world is without doubt East North avenue, between Clark and Halstead streets, a stretch of about ¾ of a mile. There can be seen in nightly operation several hundred of the popular 'Kalamazoo outdoor dividend producers.' These are all placed at the curb line, from 20 to 25 feet apart, suspended from ornamental cast iron posts. The writer interviewed a number of the merchants on this busy thoroughfare who, without exception, testified that they were more than well pleased with the splendid illumination afforded through these gas arcs. The lamps were installed by the Ogden Gas Company, which lights and extinguishes them at stated hours, and are maintained and operated on a flat rate basis. The success of this class of outdoor illumination is established and it is good and profitable to the companies, and as the public are well satisfied with it, gas companies as a rule should lose no time in taking advantage of its benefits, for lamps thus installed are sure to be permanences, thus yielding a steady revenue to consumer and company alike."

THE Directors of the Peoples Gas Light and Coke Company, of Chicago, recently adopted a preamble and resolutions to the memory of its late Third Vice-President, Mr. Clarence K. Wooster. The set is so beautiful and thorough a testimonial to the deceased that we reproduce the same in full:

"*Wherefore*, the Company desires to place upon its records an imperishable testimonium of the services rendered by him during a long period of years; of the esteem in which he was held by this Board and his associates in the management and direction of this Company, and of the great loss sustained by this Company in his untimely death.

Resolved, Clarence Kingman Wooster entered the service of this Company in 1885 in a clerical capacity, from which, by successive promotions, he became in 1897 the Third Vice-President. He died on September 9, 1906. During all that time he was intimately connected with the fiscal affairs of this Company, and for nearly 10 years he was at the head of that department.

During his connection with this Company he always gave to his duties the most painstaking, industrious, intelligent, loyal effort, and his high sense of honor and integrity was a striking example to all officers and employees of this Company. To his initiative in methods of keeping the books and accounts and in collecting and disbursing its funds is this Company indebted for large savings in the conduct of its business.

During all the years of his service there were many trying periods, but, whether in fair or foul business weather, and no matter how urgent, tense, or delicate might be the situation, Mr. Wooster's unfailing courtesy and gentleness, combined with his scrupulous consideration for others, cheered and made easy and delightful the transaction of business with him.

A gentleman by instinct as well as birth. the social side of his character furnished an inspiration to all who came within the charm of his personality. His death at the age of 48 is not only a great loss to this Company but is a personal bereavement to the members of this Board and to all the officers of this Company. Be it

Resolved, That this Board deplores the death of Mr. Wooster and in this way desires to record its appreciation of his services to the Company and its sense of the profound loss this Company has sustained in his death."

"T. J. L.," writing from Palestine, Tex., the 27th ult., incloses the following editorial, from a recent issue of the Palestine *Daily Herald*, concerning its thought regarding the Palestine Gas Company, its promotors and proprietors—we hope the *Herald* will continue in this frame of mind for many seasons to come, and that hope is strengthened in the knowledge that the Palestine gas people will not give either the *Herald* or the people of Palestine any cause for just complaint. The mention is: "In referring to the people associated with the Gas Company in this city, it is often remarked that they are hustlers, and they are courteous business people. And why shouldn't they be? Why shouldn't all business people be courteous, accommodating and obliging? Is it such a rare trait in people associated with concerns of this kind that it must be commented upon? The very existence of any concern, or at least its favor and popularity, depends upon these qualities. And yet all that is said of the gas people is true; they are hustlers every day of every week, and they are as obliging and accommodating as people can be. And they are reaping a rich success. The plant, chartered a

$400,000, is one of the best and most complete in the State, and the service is just as good as the best. True, the service is not as cheap[1] as that furnished some of the other cities, but the management say it is as cheap as first-class service can be furnished a city of this population. As attesting the popularity of the plant, several car loads of cooking stoves, ranges, heaters and gas fixtures have been sold to patrons in Palestine, and the large force of men are days behind with their orders. The new street lights just installed are efficient and beautiful, and they make Palestine one of the best lighted cities in Texas. The gas plant is a go."

MR. C. W. BUTTERWORTH, Secretary of the St. Albans (Vt.) Gas Light Company, informs us that the annual meeting of its shareholders will be held in its office, 29 Kingman street, St. Albans, at 1 P.M. tomorrow. There is no likelihood that any change will be made in the executive management.

THE Consolidated Railway, Gas and Electric Company, of Charleston, S C., signalized the approach of Christmas Day by directing all of its employees to visit the market stand of "Tommy" Colerlough and to pick therefrom a turkey that most appealed to the picker's fancy.

THE Salem Light, Heat and Power Company, to do business in Salem, Washington county, N. Y., has been incorporated with a capital of $50,000. The Directors are: Jno. F. O'Brien, of Plattsburgh, N. Y.; W. A. Reynolds and M. A. White, Whallonsburg, N. Y.; and Jarvis P. O'Brien, of Troy, N. Y.

GAS in Athol, Mass., will hereafter be $2 per 1,000 gross, with 15 cents per 1,000 off on bills paid before the 10th of the month. A further reduction will be made "as soon as possible."

MR. H. A. FERRANDOU, Secretary of the New Orleans (La.) Gas Light Company, has notified the shareholders that a dividend of $3 on each share has been declared. It is payable the 15th inst.

MAYOR LIGHTNER has signed the ordinance, passed last month by the City Council of Cedar Rapids, putting the gross rate that may be charged for gas in that city at 90 cents per 1,000 cubic feet. The Company will contest the ordinance. In fact legal proceedings looking to a review of the action are underway.

SAM. D. HARRIS, Mayor of Henderson, Ky., is insisting that the local gas plant—it is a possession of that "municipality"—shall be rebuilt. There is no doubt whatever that it should be.

MR. JOHE W. COOGAN, acting as counsel for the proposed Citizens Gas Light Company, of Hartford, Conn., has obtained from Judge Gagor, of the Superior Court, an order notifying all persons interested in the incorporation of the Company to appear on a certain date, before the General Assembly, to state their reasons for assenting or dissenting to the incorporatien of the Company.

THE expanding business of the Waukesha (Wis.) Gas and Electric Company has gotten to the stage which required it to seek new office quarters. After the first prox. the Company will be comfortably housed in a commodious ground floor in the Putney Block.

THE Detroit Councilmanic Committee on Public Utilities has recommended that its successor shall appoint an expert to investigate the "entire gas situation." It is also suggested that the investigation be carried on secretly, and that it cover "a period of time sufficient to determine if the quality of gas or the pressure thereof, varies at different times and in different districts." If Dr. Bemis is not working just now, his attention is called to this opportunity; but if the Dr. is engaged why Mr. Alton D. Adams might be enabled to get on the job.

THE office of Second Assistant Gas Inspector for Minneapolis, Minn., has been abolished. The former occupant, Mr. Evan Morgan, is accordingly looking for a position. It pleases us to add that Mr. Morgan is a capable man.

THE Beverly (Mass.) Gas Company is now in position, thanks to the intelligence of its management, to receive its coal and other supplies right at its own wharf on River street. The transportation charges that this construction on Bass river save will amount to 15 per cent. or more per annum.

1. The lone fly in the ointment.

THE new gas rates at Leominster, Mass., which went into effect the 1st inst., are even now exerting an appreciable effect on the business of the Company. Superintendent F. L. Fullam is the man to whom credit is due for this action on the part of the Company.

THE shareholders of the Canandaigua (N. Y.) Gas Light Company on the 2d inst. voted to increase its capital from $50,000 to $125,000, the proceeds of the increase to be devoted to the construction of a new, up-to-date plant.

THE counting-room of the Denver (Col.) Gas and Electric Company is certainly not an Adamless Eden, and we so know from the information that in the last week of last month two happy couples that graced its desks have entered the matrimonial state. May they ever happy be.

THE plant of the Greenfield (Mass.) Gas Light Company, which has recently came into the possession of the Keene, N. H., syndicate, is to be reconstructed.

THE Long Island Gas Company, formed to operate the Milford (Conn.) Gas and Power Company, has applied to the General Assembly of Connecticut for the right to manufacture and distribute gas and electric currents. The initial capital is fixed at $50,000, and the right to increase the same to $500,000 has been prayed for. It is also asked that the Company may issue its bonds to a sum not exceeding its capital stock actually paid in. The main persons in the application are Messrs. Edgar T. Clark. James A. Perry, Joseph H. Barnes and Geo. W. Smith, all of Milford.

WHAT do you think of this? The celebrated assortment shop, Siegel-Cooper, in New York, has opened a new "department." It is known as the "gas inspection department," and is in charge of a man named Gregory, who some years ago pestered the gas engineers of the country by his insisting upon their personal examination of a patented burner. The Siegel-Cooper prospectus regarding the "department" and its main floor walker, declares that in it and by him "any gas consumer can receive instructions that will enable him to decrease the size of his gas bill, without in any way cutting off the supply of light. Consumers are invited to take to that department any gas burner and have it tested. The inspector in charge will show how to secure the greatest amount of light at the smallest cost."

THERE can be little doubt about the fact that the Herkimer County (N. Y.) Light and Power Company, which supplies either gas or electricity to the towns of Little Falls, Dolgeville, Herkimer, Mohawk, Ilion and Frankfort, has gone into the ownership of the Utica (N. Y.) Gas and Electric Company. Mr. Anthony N. Brady, President of the latter Company, evidently means to secure control of all the lighting service in his section of the Empire State.

THE Electric Gas Company, of America, which was incorporated Christmas Eve at Portland, Me., has for one of its Directors Mr. B. Van Steenbergh, whose residence is in Goshen, N. Y., and whose name has been vicariously before the gas trade of America for some years.

MR. HENRY WICK, formerly connected with the Wausau (Wis.) Company, has accepted a responsible position with the Company at Beaumont, Tex.

MR. T. A. BATES has been engaged to overlook the construction of a coal gas plant at Hopkinsville, Ky., which is to be operated as an auxiliary to the water gas plant at that point.

MR. GEORGE M. CURTIS has been elected Treasurer and Secretary of the Meriden (Conn.) Gas Company, vice the late Mr. Dodd. Mr. Chas. T. Dodd has been elected a Director of the Company, vice his father.

RATHER a unique gift was made by the employees of the fitting department of the Consolidated Gas and Electric Company, of Baltimore, Md., when on Christmas Eve they presented their Superintendent, Mr. H. C. Ross, with an excellent portrait of himself. Gen. Richard N. Bowerman made the presentation address, and the recipient did the necessary blushing; and did it well, too.

AT the special election held in De Soto, Mo., the 22d ult., the proposition to grant a franchise to Mr. Charles A. McGee, of St. Louis, for the operation of a gas plant there, was carried by a vote of 318 for to 13 against. Under the terms of the agreement the plant is to be completed and in operation within a twelvemonth. The cost of the works is put at $60,000, and the Company may charge a rate not to exceed $1.75 per 1,000 cubic feet. That certainly would seem at least a fair price.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
MANAGER.

PUBLISHED ON EACH MONDAY OF THE YEAR AT
No. 42 Pine Street, New York.
Telephone, 2996 John.

TERMS:

SUBSCRIPTION—Three Dollars per annum, in advance.
Single copies, 10 cents.

The JOURNAL is the official organ of the
NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JANUARY 7, 1907.

The Market for Gas Securities.

Changes in values for city gas shares were virtually nil last week, but whatever of change there was favored higher prices. Consolidated opened to-day (Friday) at 138 to 139, which is a gain of a point since Christmas. Rumor again has it that a union of the Manhattan and Brooklyn borough Companies is not altogether improbable. If that should come to pass Brooklyn Union certainly looks a purchase.

Peoples, of Chicago, is strong. In fact it held up remarkably well during the money-peddling, capital boosting times of December last. The Massachusetts Gas Companies shares are steady to strong, and as hitherto said there can be no doubt that they are decidedly a purchase. The accredited gas bond market is very firm. There is some talk of an opposition Company for Hartford, Conn.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JANUARY 7.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	138	139
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	101	104
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	..	105
Mutual	3,500,000	100	190	225
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	98½	100
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p.ct.	1,000,000	..	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	101	103
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	108	111
Con 5's, due 1945, J. & J.	1,500,000	..	104	110
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
1st Mtg. 5's, due 1930, M. & N	1,500,000	1,000	104	108
The Brooklyn Union	15,000,000	1,000	110	120
1st Con. 5's, due 1948, M. & N	15,000,000		107	..
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Bay State	50,000,000	50	5/16	¾
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	9	10
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co.	29,500,000	100	98	99
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,026,500	100	107½	108
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	.	90
Mortgage, 6's	3,500,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	..	..	100
Detroit City Gas Co	5,000,000	50	..	50
" Prior Lien 5's	4,618,000	1,000	..	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
" Bonds, 5's	10,500,000	..	107½	108½
Indianapolis	2,000,000	..	60	70
" Bonds, 5's	2,650,000	..	104½	105
Jackson Gas Co	250,000	50	82	..
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	..	05
Preferred	2,500,000	100	95	110
Bonds	10,000,000	1,000	104	104½
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	85	87
Massachusetts Gas Companies of Boston	25,000,000	100	61½	62
Preferred	25,000,000	100	..	85
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	6,000,000	..	137	138
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	98¼	98¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
" 2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104½	105¼
San Francisco, Cal.	15,800,000	100	..	..
St. Joseph Gas Co. 1st Mtg. 5's	751,000	1,000	92	..
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	96¼	..
Syracuse, N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	102	..
Washington, D. C	2,600,000	20	285	287½
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	..	..	..
Wilmington, Del.	600,000	50	220	..

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILADELPHIA, PA., Dec. 12, 1906.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable Jan. 15th, 1907, to stockholders of record at the close of business, Dec. 31, 1906. Checks will be mailed.

1645-4 LEWIS LILLIE, Treasurer.

DIVIDEND NOTICE.

NATIONAL GAS, ELECTRIC LIGHT AND POWER COMPANY, 402 Union Trust Bldg., Detroit, Mich.

Dividend No. 5 (3 per cent.) on the preferred stock of the company for the half year ending Dec. 31, 1906, has been declared payable Jan. 1, 1907, to stockholders of record at the close of business, Dec. 20, 1906. Checks will be mailed.

1648-1 J. T. LYNN, President.

Estimates furnished for the erection of complete gas works or the extension and modernizing of old works. All work warranted. Both water gas and coal gas.

EMPIRE GAS IMPROVEMENT & CONSTRUCTION COMPANY,
1628-tf 49 Wall Street, New York.

Position Wanted.

A Capable Manager and Superintendent,

Now employed, desires a position as manager or superintendent of gas, or combined gas and electric plants, in city of 15,000 to 25,000 population. Successful record. Southern or Middle States location preferred.

Address, "P. T. A.,"
1641-tf Care this Journal.

Wanted, Position

As Manager or Superintendent,

By man of experience and ability. Competent to show good results. Middle West preferred. Address, "C. H.,"

1647-3 Care this Journal.

POSITION WANTED.

A young man (25), married, is open for a position on or about Jan. 1, 1907. Reliable and practical bookkeeper, 10 years' experience, connected with one of the oldest and largest fireclay product manufacturers East. Thorough knowledge estimating. Highest references. Address, "ALPHA,"

1645-tf Care this Journal.

PROPOSITION TO GAS COMPANIES.

Will contract with reliable gas company to connect gas ranges, water heaters, piping old houses, repair work, complaint orders, etc., or accept position as foreman of fitting department.

1648-1 Address "A. A.," care this Journal.

WANTED.

Man wanted who is familiar with the distribution and office department of a gas company and capable of taking charge of new business department. Address, stating age, experience, and salary expected,

THE DALLAS GAS COMPANY,
1646-4 DALLAS, TEX.

WANTED,

A Young Man as Superintendent of a Water Gas Plant in a Town of 10,000 Inhabitants.

Must be acquainted with all kinds of gas construction. Address, "PURCHASER,"

1647-tf Care this Journal.

WANTED,

Second-hand 4-foot Water Gas Set.
One No. 4 Roots Exhauster, or any make of about the same capacity.
One 6-foot Station Meter.
Set of Purifiers, 8-foot by 10-foot, or 10-foot by 12-foot.

State age, condition and lowest cash price. Address, "PURCHASER."

1647-tf Care this Journal.

FOR SALE,

1 McKenzie Exhauster (10-inch connections), complete, with upright engine, governor, belting, etc.
1 Isbell-Porter Tar Extractor (16-inch connections), square type.
1 Isbell-Porter Tar Extractor (16-inch connections), circular type.
2 Isbell-Porter Washer-Scrubbers (16-inch connections).

MALDEN & MELROSE GAS LIGHT CO.,
1646-eot tf MALDEN, MASS.

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THE CALORIFIC POWER OF FUELS.

By HERMAN POOLE, F.C.S.

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Cheap and Efficient.

For Use in Works, Mains and Service Pipes. Shipped in 100-gallon Drums.

Semet-Solvay Co.,
Syracuse, N. Y.

THE NATURAL GAS JOURNAL

Should be read monthly by **ARTIFICIAL GAS MANUFACTURERS** in and near the "belt." Remember, the *striking distance* of a natural gas field is *now 200 miles* and is increasing, as also the number of fields.

***

SAMPLE COPIES FREE.

Subscription Rate, $1 per Year.

The Natural Gas Journal Company,
56 PINE STREET, NEW YORK.

1647-tf

M. J. LOXLEY CO., BANKERS,

Land Title Building, Philadelphia, Pa.

1648-tf **GAS AND ELECTRIC PROPERTIES.**

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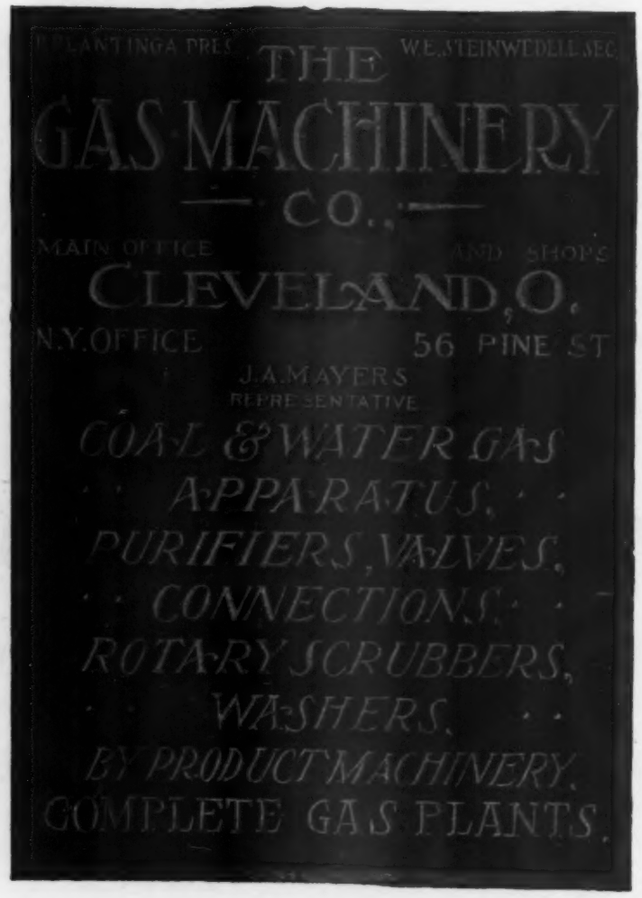
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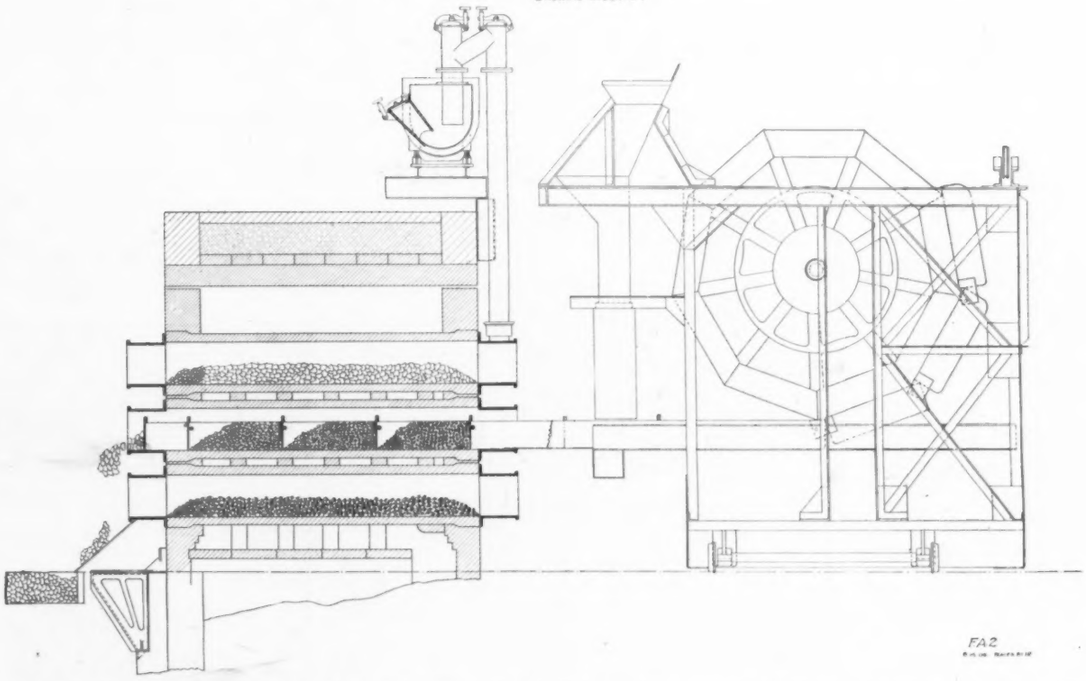

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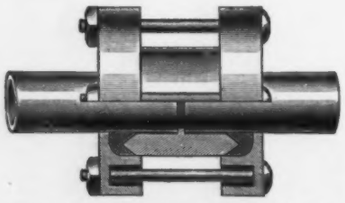
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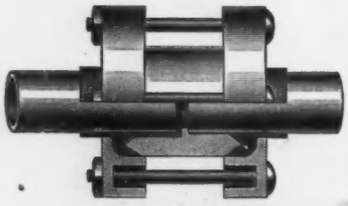
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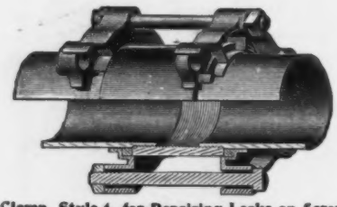
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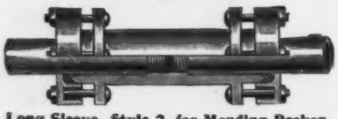
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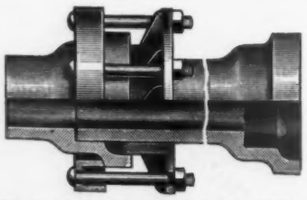
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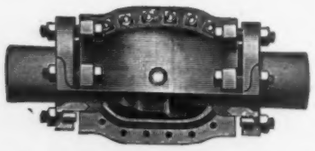
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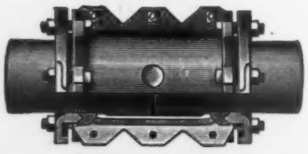
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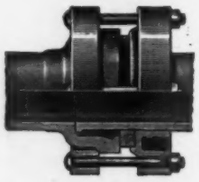
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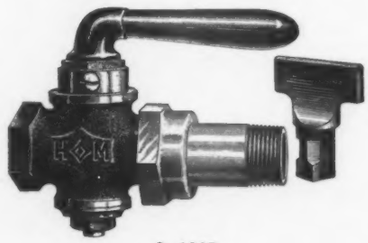

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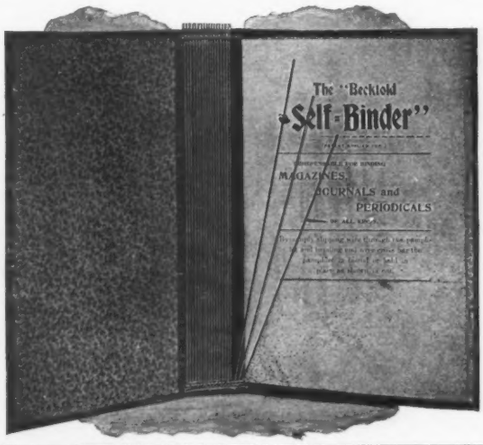

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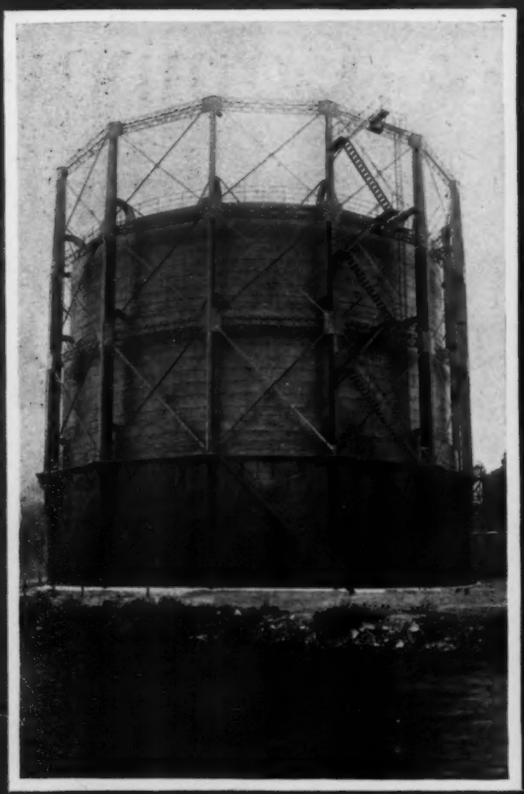

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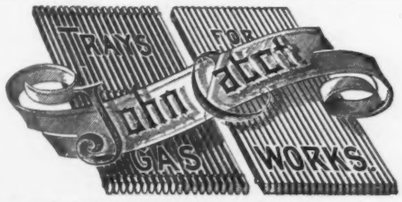

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" 1	34.00	¾ "	2	31 "	10¾ "	62 "
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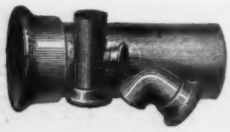

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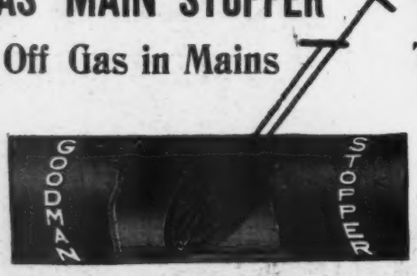

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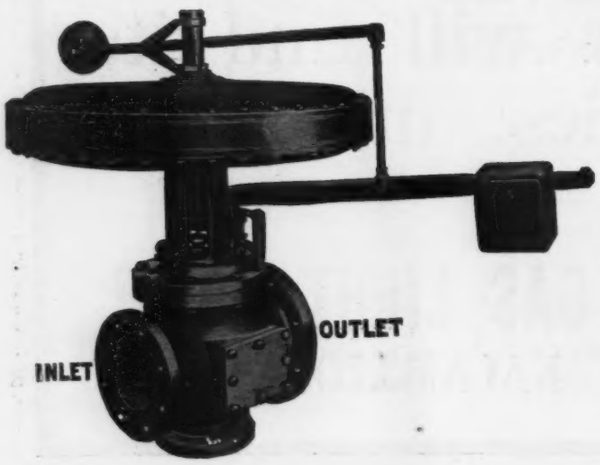

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PUBLIC LIGHTING TABLE.

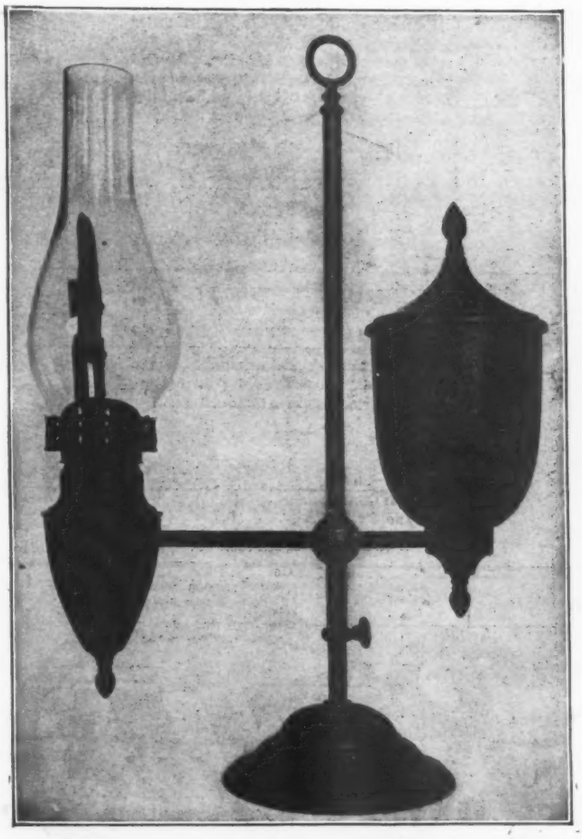
JANUARY, 1907.

Day of Week.	Table No. 1. Following the Moon. Date.	Light.	Extinguish.
Tue.	1	5.20 PM	7.40 PM
Wed.	2	5.20	8.30
Thu.	3	5.20	9.30
Fri.	4	5.20	10.30
Sat.	5	5.20	11.40
Sun.	6	5.20	12.10 AM
Mon.	7	5.20 LQ	1.50
Tue.	8	5.20	3.00
Wed.	9	5.20	4.10
Thu.	10	5.20	6.20
Fri.	11	5.20	6.20
Sat.	12	5.20	6.20
Sun.	13	5.30 NM	6.20
Mon.	14	5.30	6.20
Tue.	15	5.30	6.20
Wed.	16	5.30	6.20
Thu.	17	5.30	6.20
Fri.	18	9.10	6.20
Sat.	19	10.10	6.20
Sun.	20	11.10 FQ	6.20
Mon.	21	12.10 AM	6.20
Tue.	22	1.10	6.20
Wed.	23	2.10	6.20
Thu.	24	3.00	6.20
Fri.	25	4.00	6.20
Sat.	26	4.50	6.20
Sun.	27	5.30	6.10
Mon.	28	No L.	No L.
Tue.	29	No L FM	No L.
Wed.	30	No L.	No L.
Thu.	31	5.50 PM	8.30 PM

TOTAL HOURS DURING 1907.

By Table No. 1.

	Hrs.Min.
January	211.10
February	193.40
March	182.10
April	167.00
May	157.00
June	145.30
July	151.50
August	162.30
September	175.30
October	202.40
November	209.30
December	231.50
Total, yr.	2190.20



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10-Candle Power.

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This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

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2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

JANUARY, 1907.

Day of Week.	Table No. 2. New York City. All Night Lighting. Date.	Light	Extinguish.
		P. M.	A.M.
Tue.	1	4.30	6.30
Wed.	2	4.30	6.30
Thu.	3	4.30	6.30
Fri.	4	4.30	6.20
Sat.	5	4.30	6.30
Sun.	6	4.30	6.30
Mon.	7	4.30	6.30
Tue.	8	4.40	6.30
Wed.	9	4.40	6.30
Thu.	10	4.40	6.30
Fri.	11	4.40	6.30
Sat.	12	4.40	6.30
Sun.	13	4.40	6.30
Mon.	14	4.40	6.30
Tue.	15	4.50	6.25
Wed.	16	4.50	6.25
Thu.	17	4.50	6.25
Fri.	18	4.50	6.25
Sat.	19	4.50	6.25
Sun.	20	4.50	6.25
Mon.	21	4.50	6.25
Tue.	22	5.00	6.25
Wed.	23	5.00	6.25
Thu.	24	5.00	6.25
Fri.	25	5.00	6.25
Sat.	26	5.00	6.25
Sun.	27	5.00	6.25
Mon.	28	5.00	6.25
Tue.	29	5.05	6.15
Wed.	30	5.05	6.15
Thu.	31	5.05	6.15

TOTAL HOURS DURING 1907.

By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

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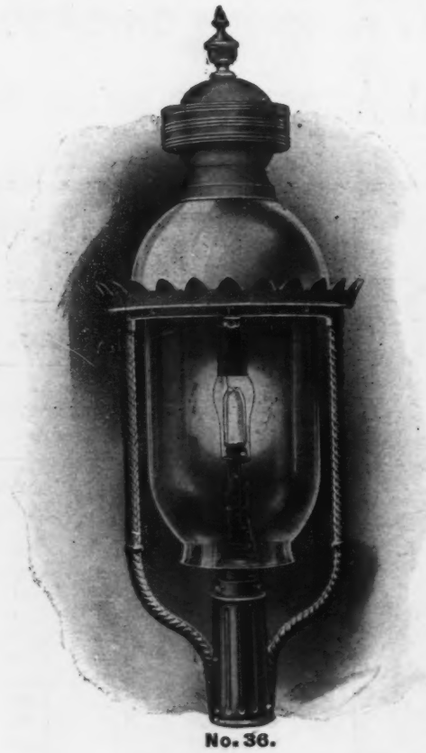

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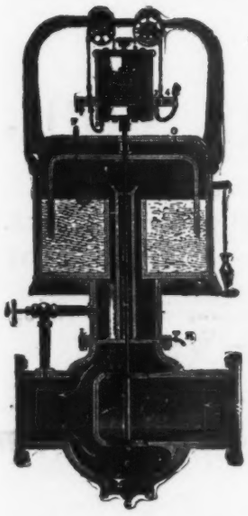

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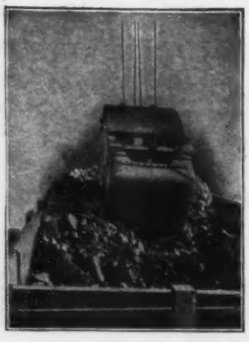

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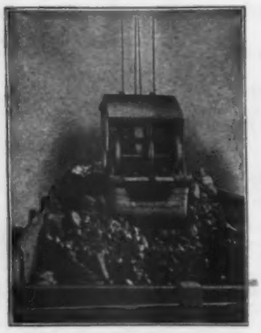

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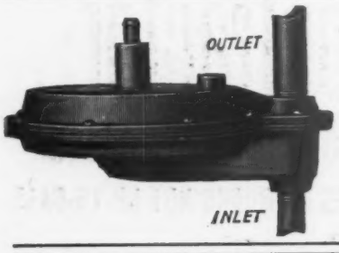

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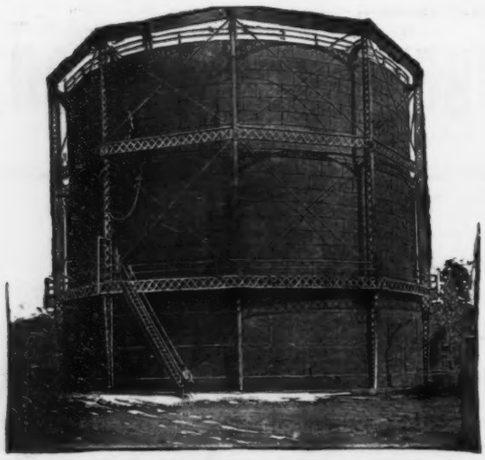

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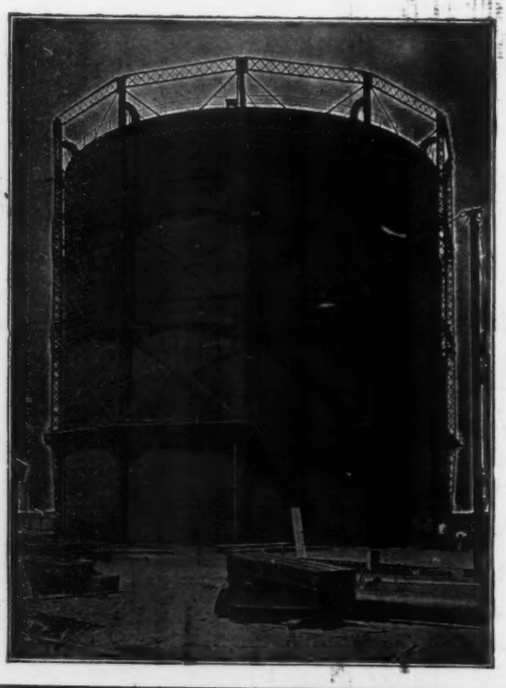

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